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Number 3.

MARCH, 1901.

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TABLE OF CONTENTS, - - - - Page 443
CLASSIFIED INDEX FOR BUYERS, - - Page 543

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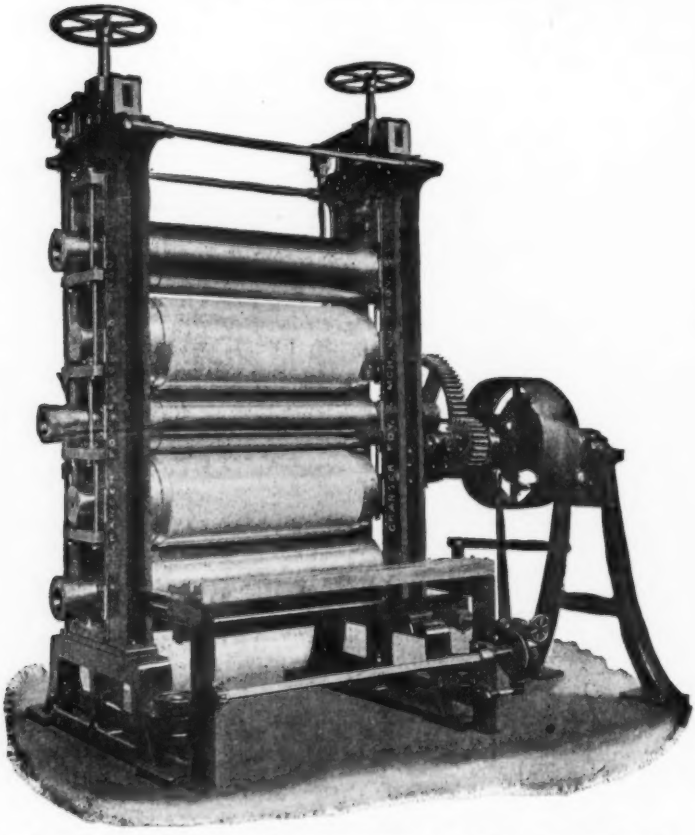
Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDERS, MANGLES AND ROLLS.

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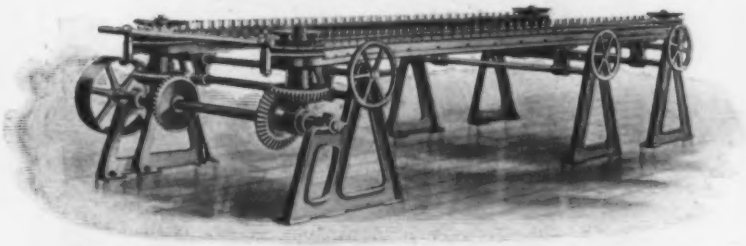

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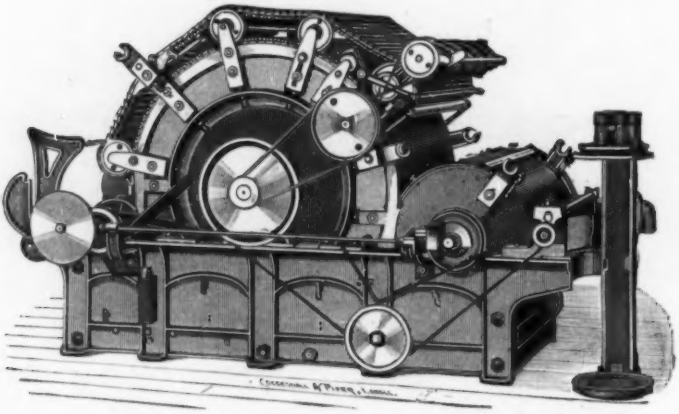


Revolving Flat Cards, Railway Heads,

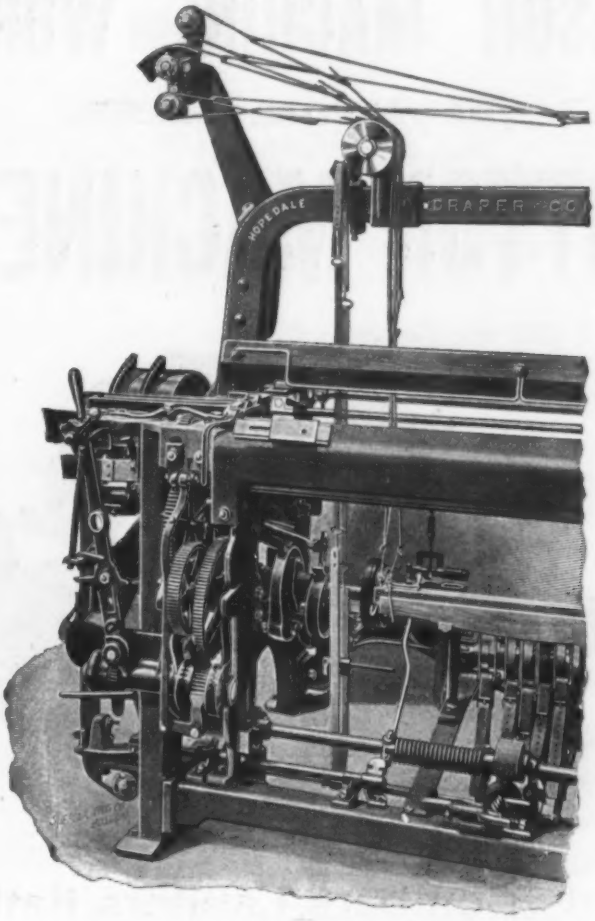
Ring Spinning Frames, Fly Frames,

Drawing Frames, Spoolers, Warpers,

Slashers, Looms.

Worsted Machinery.

ILLUSTRATED CATALOGUES SENT ON APPLICATION.



A Few Details

Of one of our recent constructions in

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WE INVITE CORRESPONDENCE.

THE DRAPER COMPANY, Hopedale Mass.

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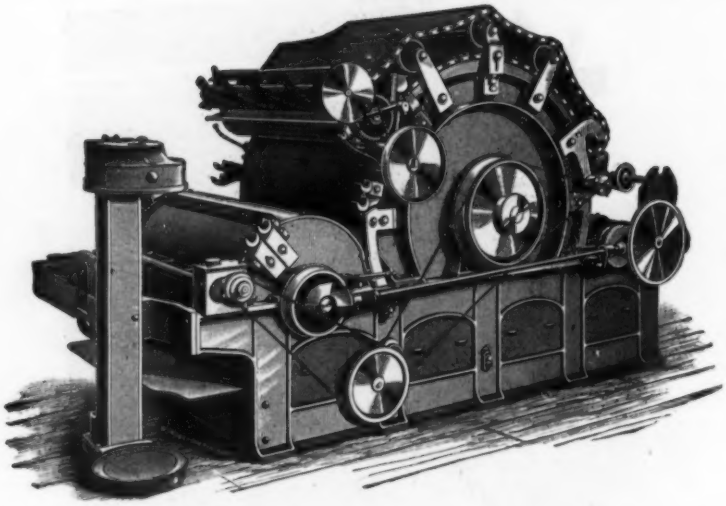

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SLUBBING FRAMES
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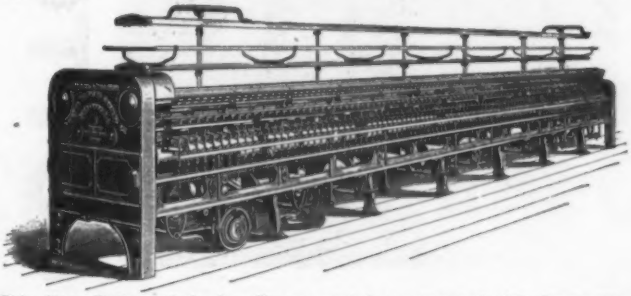

This New Pattern Spinning Frame contains many valuable improvements which will certainly interest you and pay you to investigate. All parts are specially designed and so constructed as to obtain the highest speed and greatest production.

We Invite Investigation and Comparison.

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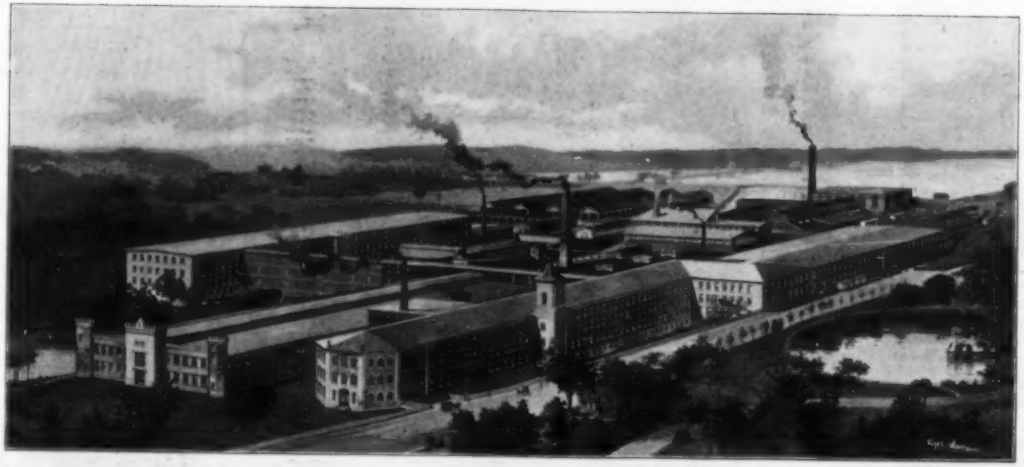

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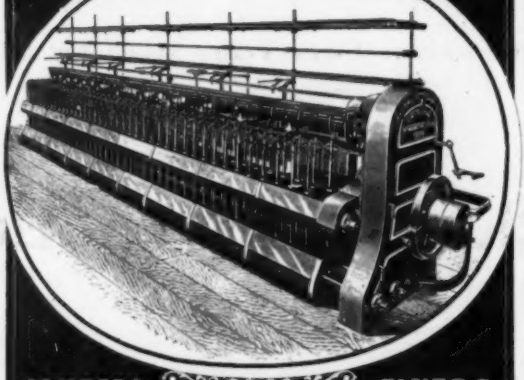

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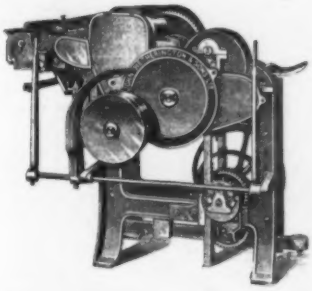

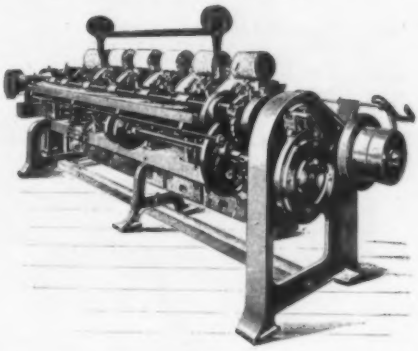

Sliver Lap Machines

with Self Acting Stop Motion.

Ribbon Lap Machines

with six Laps behind for preparing Laps for Combing Machines, made to suit any width of Laps required.

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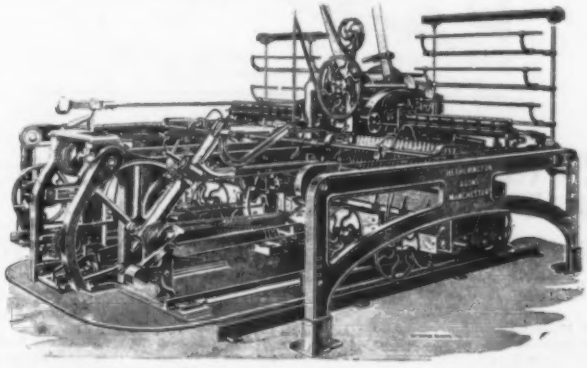
single and double Nip for six or eight heads, to take Laps from 7 1-2 in. to 10 1-2 in. wide. Patent Stop Motions for stopping Machine, when delivering too light Slivers, or after any required length has been delivered.



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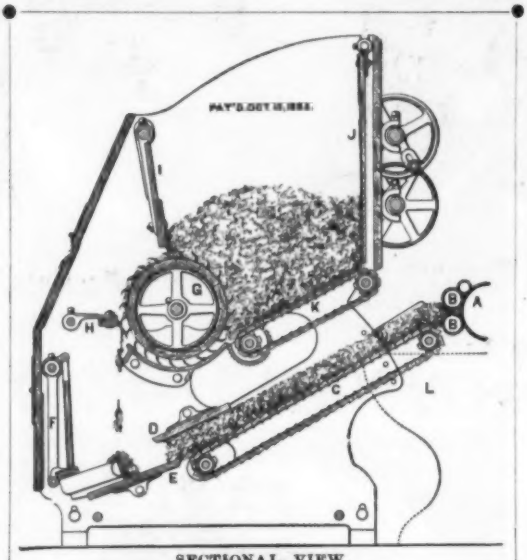

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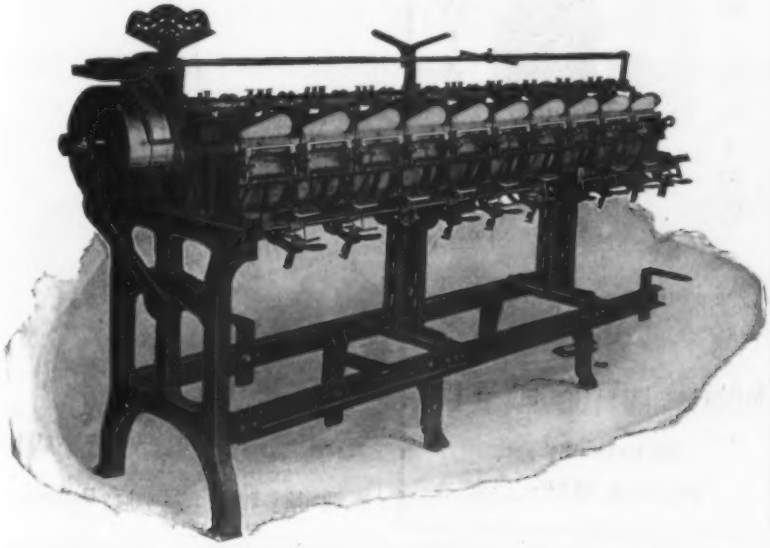

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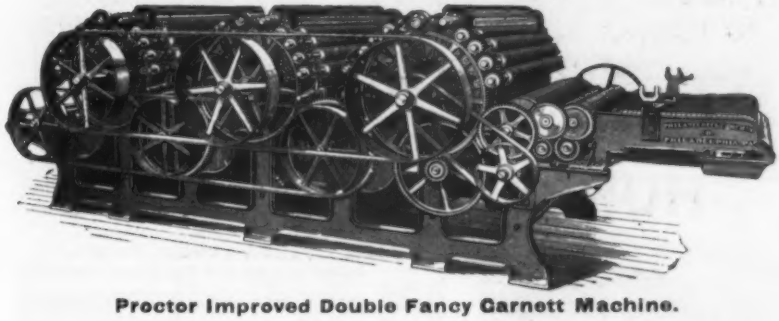


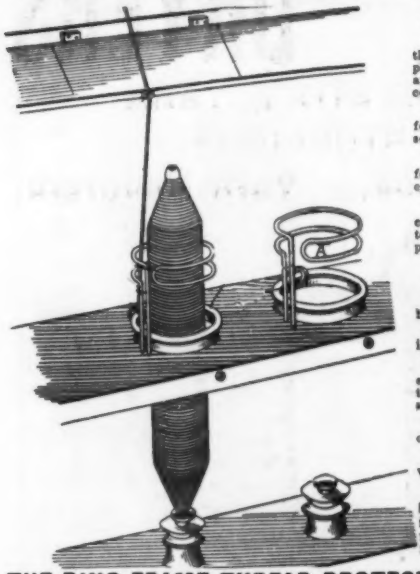
Proctor Improved Double Fancy Garnett Machine.

PHILADELPHIA TEXTILE MACHINERY CO.,

2750-60 Hancock St.,

PHILADELPHIA, - - - PA.

New Thread Protector for Ring Spinning



The following advantages are claimed for this protector.

1. The speed of the frame will be increased, and also the production on frames without any protectors or plate separators about twenty five to thirty per centum, and on frames with separators about twelve or fifteen per centum.

2. The threshing and consequent imperfection and inferiority of yarn and cloth, occasioned by the use of blade separators is entirely obviated.

3. The traverse of the rail can be increased from one-fourth of an inch to one inch, if frame permits, thereby enabling the use of longer bobbins.

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5. Frame and rail more perfectly balanced.

6. Heavier travelers can be used.

7. The yarn is wound tighter and more uniformly on bobbins.

8. A material saving in time of doffing, as more yarn is wound on, and longer bobbins can be used.

9. Saving of time of the operator on account of fewer ends breaking, thereby increasing the quality of yarn, and the operator can attend many more spindles in consequence.

10. The life of the ring will be prolonged on account of decreased friction.

11. No accumulation of lint, dust and dirt, which invariably results in the use of blade separators.

The above results have been obtained in the mills of S Sanford & Sons, Carpet Manufacturers, Amsterdam, N.Y., in whose mills the protectors have been in use on all spinning frames since October, 1899, and by permission we refer to said firm for a confirmation of our claims.

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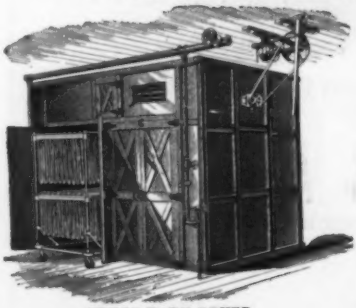

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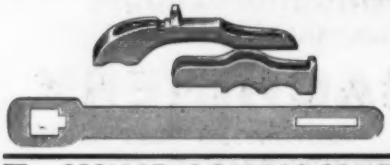

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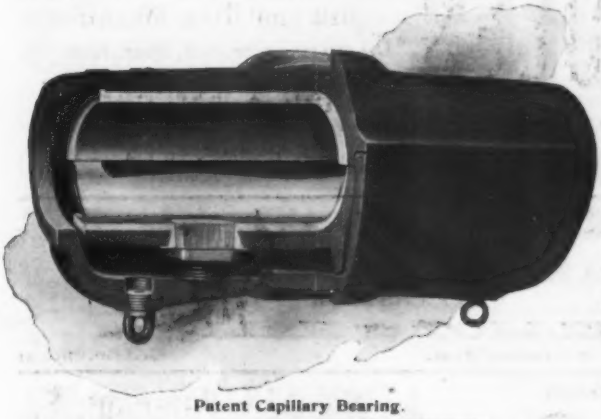

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MILWAUKEE, WIS., Oct. 13, 1900.

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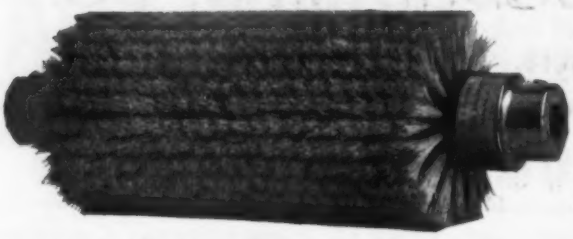

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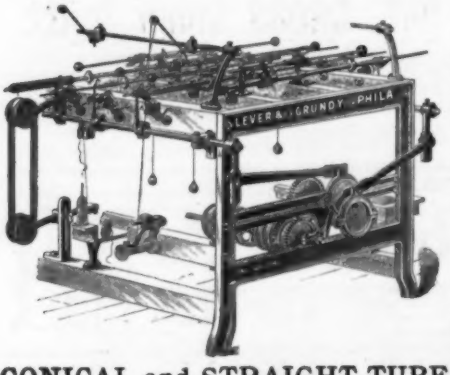

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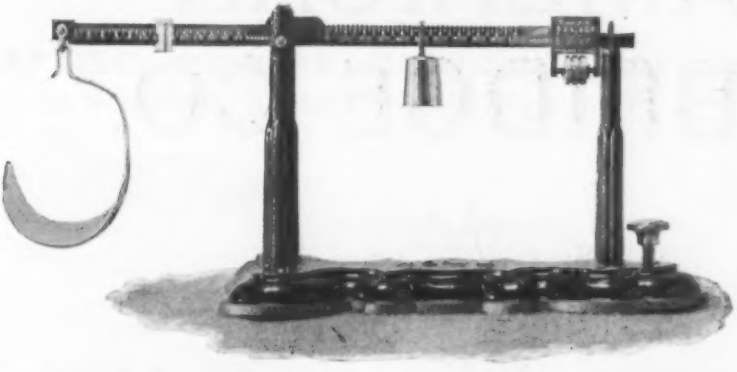

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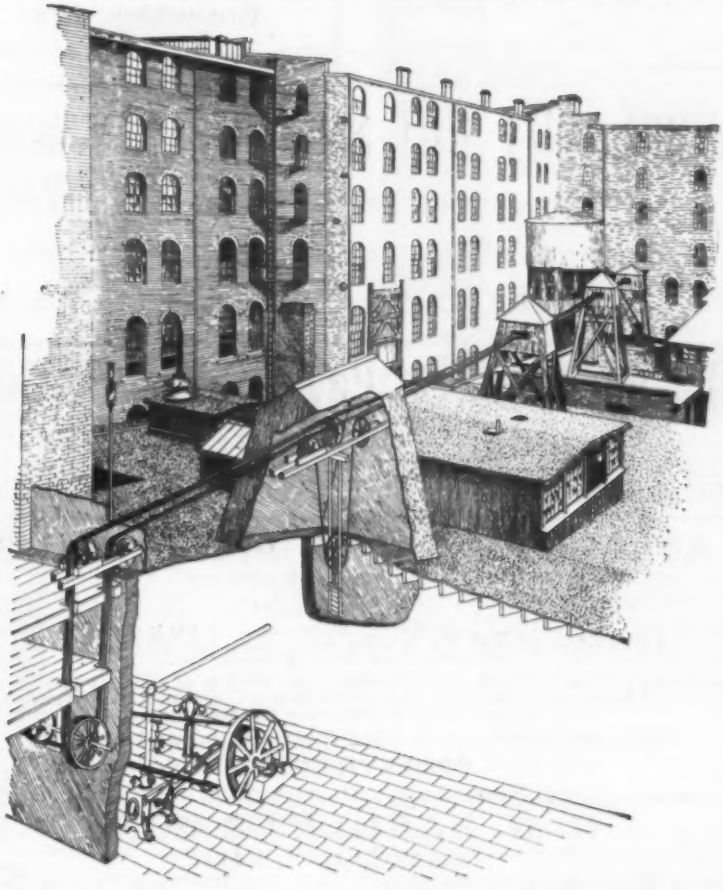

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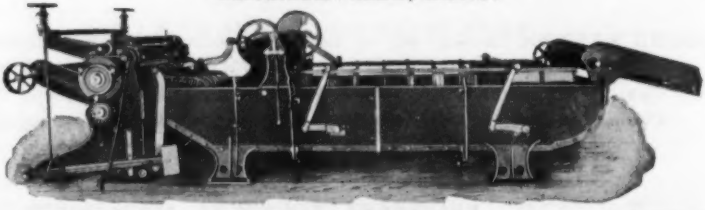

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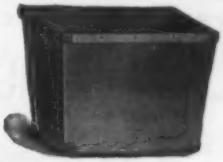

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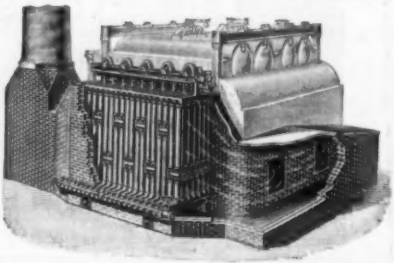

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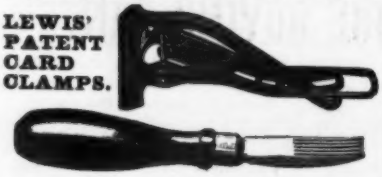

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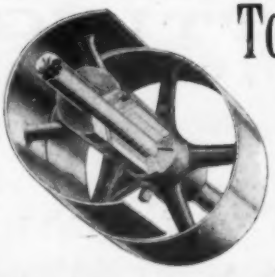

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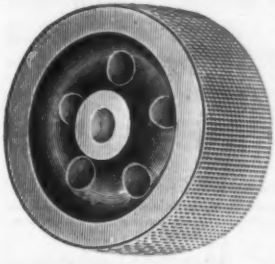

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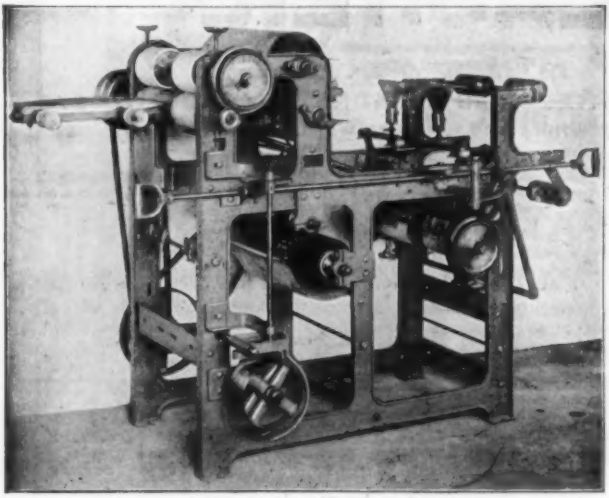

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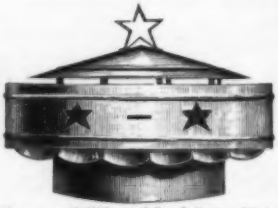

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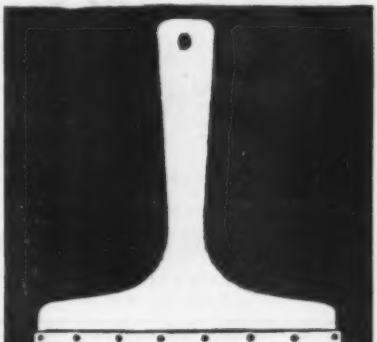

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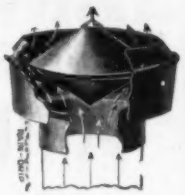

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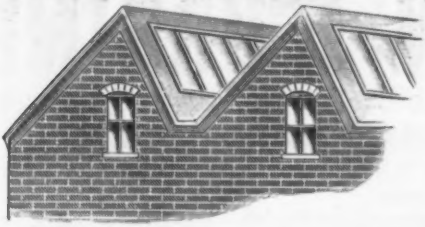

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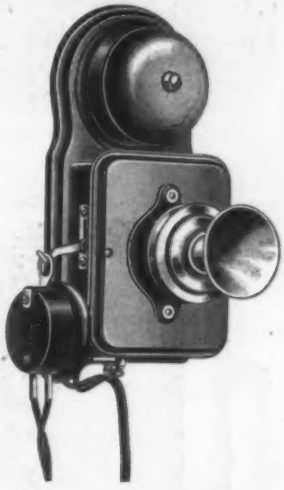

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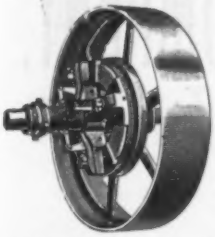

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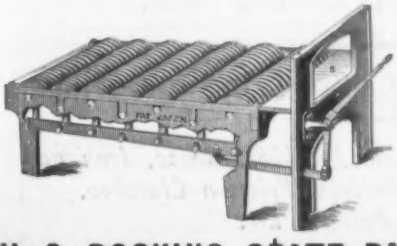

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CONTENTS.

	PAGE
Portrait and Biographical Sketch of John Stedman Holden	449
From the Fleece to the Garment	450
Cost of Silk Goods	452
Notes of the Month	454
Wool Market	455
Cotton Market	457
Humidity; Its Importance in Wool Manufacture	459
The John on Humidostat	467
The New Foster "1900" Winder	468
Improved Cotton Machinery	470
Cotton Department	
American Cotton Spinning Machinery—Room Management from a Speeder Tender's Point of View—The Relation Between Speed of Loom and Size of Yarn—Waste in Combing Cotton	473
Woolen Department	
Steam or Luster Finish—Improved Shoddy Picker—Second Breaker and Finisher Card Feed—The Preparation of Wool for Worsted Yarn—Effect of Air Moistening on Finishing Woolens	481
Knitting Department	
The Knit Good Situation—Sewing and Finishing Machines in Underwear Mills—Removing Seeds from Cotton Knit Goods—Hosiery Mill—Circular Knitting Machine for Fancy Effects—New Knitting Mills	489
Silk Department	
Calculating the Cost of Silk Goods—A Model Silk Dyehouse	497
Power Department	
Power Transmission—Development of the Electric Drive—The Use of Iron in Mill Construction	504
Dyeing Department	
Receipts—Process of Dyeing—The Use of Mordant Dyes in Printing Cotton Goods—New Method of Fabric Printing—White Designs on Colored Grounds—Stripping the Color from Textiles	511
Questions and Answers	519
New Publications	522
Industrial News	525
Textile Patents	445
Mill News	529
Personals	538
Buyers' Index	54

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List of Textile Patents.

Issued Feb. 5, 12, 19 and 26, 1901.

Carding Machine Feeding Mechanism. 667,708. H. Kemp, Collinsville, Mass.

Cloth Cutting or Like Machine. 668,632. R. A. England and H. Roberts, Bingley, Eng.

Cloth Napping Machine. 668,510. I. N. Forrester, assignor to Blair Mfg. Co., Camden, N. J.

Dyeing, etc., Apparatus for. 667,825. J. Major, Eccles, Eng.

Fabric. 668,010. C. Green, Uxbridge, Mass., assignor to A. C. Warren, Newton, and G. L. Stevens, Boston, Mass.

Fabrics, Composition for Use in Treating Textile. 668,011. C. Green, Uxbridge, assignor to A. C. Warren, Newton, and G. L. Stevens, Boston, Mass.

Fabrics. 668,145. C. Green, Uxbridge, assignor to A. C. Warren, Newton, and G. L. Stevens, Boston, Mass.

Fabric and Strand for Producing Same. 667,601. W. M. Stevenson, Springfield, Mass., assignor to Hodges Fibre Carpet Co., Indian Orchard, Mass., and Portland, Me.

Fabric Cutting Machine Adjusting Device. 667,240. H. A. Meyer, assignor to Wolf Electrical Promoting Co., Cincinnati, Ohio.

Fibrous Materials, Apparatus for Removing Impurities From. 668,907. C. Delerue, Roubaix, France.

Knit Cap, and Making Same, Flat. 669,011. N. E. Kahn, assignor to A. Kahn and A. H. Stephenson, Philadelphia, Penn.

Knitted Fabric. 668,793. J. Bradley, N. Chelmsford, Mass.

Knitting Machine. 668,833. G. H. Gilbert, Germantown, Pa., assignor to the Kilbourn Knitting Machine Co.

Knitting Machine Attachment. 668,569. F. B. Wildman, assignor to McMichael and Wildman Mfg. Co., Norristown, Pa.

Knitting Machine Take-up Mechanism. 668,568. F. Wilcomb, Norristown, Pa.

Knitting Seamless Stockings with Lace Work Effect, by Machinery. 668,674. H. Brown, Philadelphia, Pa.

Loom. 667,557. H. McKee, Derby, Conn., assignor of one-half to R. F. Adams, New York, N. Y.

Loom for Weaving Tufted Pile Fabrics. 668,679. J. I. Collins, assignor to S. Sanford & Sons, Amsterdam, N. Y.

Loom Harness. 667,812. P. A. Wagner, Carlstadt, N. J.

Loom Jacquard Machines, Operating Mechanism for. 667,458. O. W. Schaum, Philadelphia, Pa.

Loom Reed Motion. 667,582. E. H. Ryon, assignor to Crompton & Knowles Loom Works, Worcester, Mass.

Loom Shuttle. 668,123. J. T. Ahrens, assignor of one-half to W. F. Smalley and E. T. Knight, Wilmington, Del.

Loom Shuttle Changing Motion. 667,767. B. Crossley, Burnley, Eng.

Loom Shuttle Tension Device. 668,454. W. Orr, assignor to New Jersey Wire Cloth Co., Trenton, N. J.

Loom Temple. 668,133. E. S. Stimpson, Hopedale, Mass., assignor to Draper Co., same place and Portland, Me.

Loom Warp Tension Mechanism. 667,527. G. F. Hutchins, assignor to Crompton & Knowles Loom Works, Worcester, Mass.

Loom, Weft Replenishing. 667,529. W. Jacobs, Providence, R. I., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

Looms, Thread-Parter for Weft Replenishing. 667,661. J. Northrop, Hopedale, Mass., assignor to Draper Co., same place and Portland, Me.

Spinning Frame Stop Motion. 668,039. W. G. Eaton, Nashua, N. H., assignor to Draper Co., Hopedale, Mass., and Portland, Me.

Spinning Roll Weight Levers, Lever Screw for Holding. 668,131. H. A. Owen, Whitinsville, Mass., assignor to Draper Co., Hopedale, Mass., and Portland, Me.

Twisting Machine Stop Motion. 667,810; 667,811. J. E. Tynan, Paterson, N. J.

Warp Machine, Circular. 667,701. H. Hill, Nottingham, Eng.

Wool, Apparatus for Treatment of. 668,502. A. G. Dear, London, Eng.

Wool Washing Apparatus. 667,231. H. G. Layng, South Amboy, N. J.

Yarn, etc., Lustring and Stiffening. 667,520. E. Heberlein, Wattwil, Switz.

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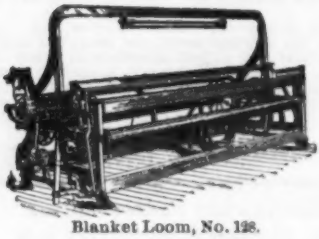

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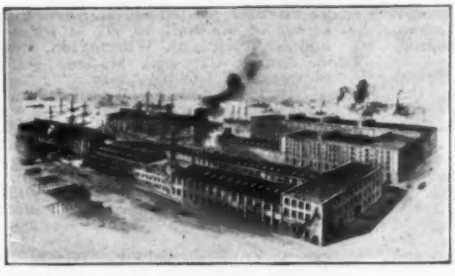

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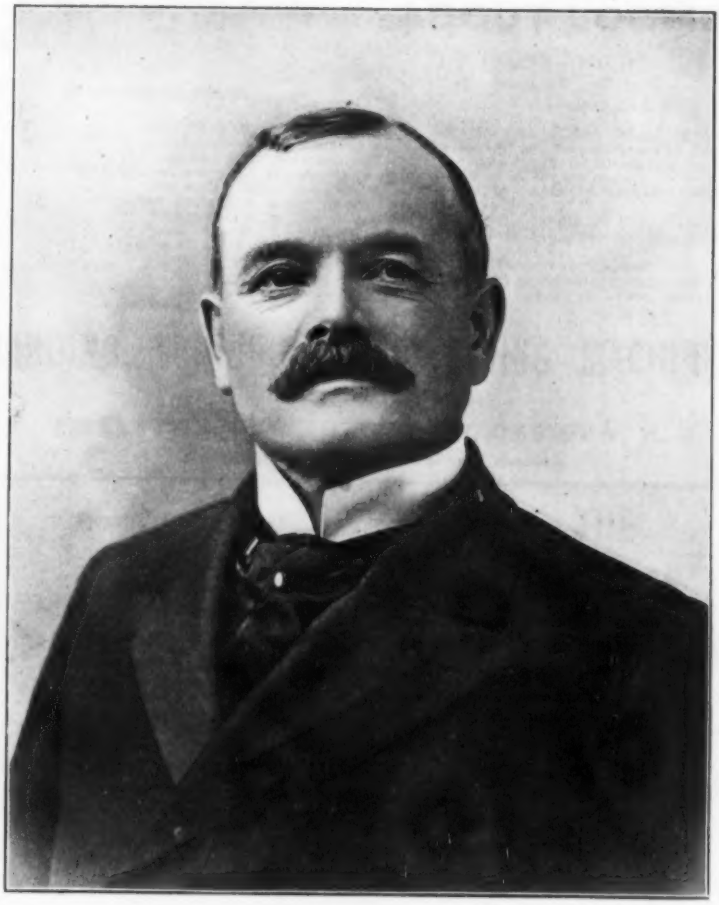


JOHN STEDMAN HOLDEN.

TEXTILE WORLD.

Vol. XX. MARCH, 1901. No. 3.

JOHN STEDMAN HOLDEN.

John Stedman Holden was born on a farm in Charlton, Mass., May 9, 1845, and is today a prominent woolen manufacturer, operating large mills in Bennington, Vermont, and New Bedford, Mass. In a very marked manner does his career show the value not alone of practical experience inside of the mill in the actual manufacture of goods, but especially of the business instinct or capacity for trading, which in every manufacturing enterprise is required in addition to the knowledge of the mechanical operations.

Mr. Holden attended the public schools at Charlton, and later Nichols Academy, Dudley, Mass. He afterwards took a course of study at the Wesleyan Academy, at Wilbraham, Mass., and graduated at Eastman's Business College, at Poughkeepsie, N. Y. At the age of nineteen, he went to Hartford, Conn., and was there employed in various occupations, such as roofing, and hanging telegraph wires between Hartford and Providence.

At the age of twenty-two, he was appointed to a position on the police force of Hartford, Conn. At that time there were but twenty-five policemen in Hartford, and Mr. Holden was the youngest officer on the force. He was married at Hartford, October 21, 1868, to Jennie E. Goodall. He served as policeman three years, and then removed to Palmer, Mass., where he formed a partnership with his brother, and conducted a general store under the name of H. P. & J. S. Holden, later establishing two branch stores. This partnership was dissolved in 1879, when Mr. Holden purchased an oil refinery at Miller Farm, near Titusville, Penn., and carried on the business of oil refining, under the name of the Crystal Oil Works. A year later the Standard Oil Company made it for his interest to retire from that business.

He sold his refinery to that company, and in 1883 built a woolen mill at Palmer, Mass., which he operated until 1889, under the name of J. S. Holden & Company. From the very beginning of this enterprise he sold the product of the mill direct to the trade, without the assistance of any commission agents.

In 1889, he sold his interest in the mill to his brother and C. E. Fuller, the latter being the superintendent of the mill. He at once formed a partnership with C. W. Leonard of Newtonville, Mass., and his son, Arthur J. Holden, under the name of Holden, Leonard & Company. They bought the Bennington Woolen Mills, at Bennington, Vt., and have since operated them very successfully.

While in Palmer, he bought the Palmer Wire Mills, at auction, and organized a company that operated these mills for several years. He sold his interest in this concern in 1890, and has since devoted his attention to the woolen business. In April, 1899, Holden, Leonard & Co., purchased the Oneko Woolen Mills, at New Bedford, Mass., and are now operating them in connection with their mills at Bennington. Mr. Holden is interested in the Woodbury Granite Company, of Woodbury, Vermont, being president of that company, and also with the

firm of Bickford, Moore & Company, in Hardwick, the latter firm being extensive granite cutters.

He was the leading spirit in the building of the Hardwick & Woodbury R. R., ten miles long, leading from Hardwick to the granite quarries and is president of this road and of the Bennington County National Bank. His career brings out strongly the value of the business instinct in woolen manufacturing enterprises. He is a keen judge of human nature, and his success is due to good judgment in the selection of his employees, as well as his business ability and square dealing.

FROM THE FLEECE TO THE GARMENT.

"The only way to make a woolen mill pay, is to have a sheep ranch at one end and a tailor shop at the other," are the words in which a woolen manufacturer of many years experience was wont to state the necessity for bringing the producer and consumer nearer together.

The half of this statement which relates to the sheep ranch, can safely be left out of consideration. A small four set mill running on a medium grade of all wool goods, would consume the wool grown by 75,000 sheep, and the impossibility of locating even a small woolen mill with the necessary help and power on a ranch with 75,000 sheep, places the idea in the region of dreams.

There are, indeed, woolen mills of even larger capacity, producing "all wool" goods, that could get along comfortably with one sheep and then have surplus wool to sell, but in such cases the small amount of wool consumed would prevent the possibility of economy at the wool end of the mill.

But the other part of the statement referring to the tailor shop, comes much nearer the truth.

We find that the essential character of the knitting industry makes the knitting mill an actual tailor shop, and consequently the finished goods, as they leave the knitting mill, are much nearer the consumer than is the product of the cloth mill. Owing to the much smaller variety in quality, weight, color, and style of knit goods, the merchant buys larger quantities of each style of goods, and this simplifies the work of distribution, and enables the retailer to get still nearer to the manufacturer.

But in the cloth industry very different conditions prevail. The finished product of the mill is the raw material for the manufacturing clothier. Manufacturing clothing is an industry involving in itself many different processes, with complex details, and requiring special knowledge and training on the part of both operative and proprietor.

Taking the case of men's wear clothing for illustration, we find that the retailer must carry a stock of clothing made from many different fabrics, and with many different colorings of each fabric. The jobber's stock has the same varied character, and for such a trade to be carried direct to the mill, means one of two things. The jobber or retailer must buy from many different mills, each making a distinct fabric into garments; or each mill must manufacture a great variety of fabrics, and make them up into many different styles of garments.

Either alternative presents such great difficulties for both mill man and clothier as to place in the distant future any combination of these two great industries under one head.

The economies that would result from such a combination would be many and of large proportions. The commission system of selling with all of its admitted evils, would be done away with. Many expenses and charges for commissions, middlemen's profits, freights, samples, etc., would be saved. Unjust claims by the manufacturing clothier would be impos-

sible, for the cloth manufacturer would be the clothier.

Many seconds are made in every mill which are in reality perfect goods. They may vary in shade, quality or weight from the bulk of the pieces, and be called seconds when in all essential qualities they are equal to perfect goods. Remnants in large numbers are cut because of small imperfections near the ends of the pieces.

If the cloth manufacturer made up his cloth into garments, these remnants and seconds could be used to as good advantage as the perfect goods. The allowances for small imperfections in perfect goods, which are made by every manufacturer, is a large item in the cost. It is safe to say that in the great majority of cases the clothing manufacturer cuts around these imperfections, and that they cause him no loss or extra expense. The saving of these allowances would be another large economy effected by the new system.

Owing to the character of the two industries, and the resulting difficulties which we have just referred to, any attempt on the part of individual manufacturers to combine the two trades of cloth manufacturer and clothier at once, would be attended with great risk, if not certain failure.

The attempts which have already been made in this direction, do not either by their extent or number, warrant any general deductions as to the feasibility of the scheme. These attempts have been made by small mills. Some have been failures, and no business is exempt from that result. Others which have met with a fair degree of success, have been made by small mills surrounded by peculiar local conditions which made success possible on a small scale.

But speaking broadly, the entire question of whether the manufacture of raw stock into a garment ready for the wearer, is feasible or not, is still in the domain of the unknown. A case came to our attention recently which shows the latent possibilities of such a combination. A mill was manufacturing and selling a 6/4 men's wear fabric for $1.00 per yard, and the suits made from these goods were retailed at $15.00. This mill engaged a local manufacturing clothier to make up 200 pieces of the cloth. After this had been done, it was found that 3¼ yards of cloth had been used for each suit, making cost for cloth $3.25 per suit, and the cost for manufacturing and trimming the suits amounted to another $3.25, making total cost $6.50. These garments were sold for $12.00 each, or $3.00 less than the regular market price, and gave a liberal profit to the mill.

If such a revolution in business methods as we are considering, ever takes place, it is likely to be the result of a slow growth or process of evolution. The process which we already see going on, of eliminating middlemen, is a movement in the direction of this consolidation. The number of mills selling their own goods increases with every year. Manufacturing clothiers are adopting the policy of buying direct from the mills. Both of these movements bring the manufacturer and consumer nearer. The actual union of these two manufacturing industries can be effected easier, and probably will await the time when most if not all of the middlemen's charges have been eliminated.

The progress in the meantime will be the result of the natural law that trade follows the line of least resistance. The result of any attempt to unduly hasten this movement will be beneficial only to those who do not engage in it, by showing what to avoid.

The only assistance which can be given to the movement is to take advantage of the economies which come within reach from day to day, and leave the rest to the operation of great and to some extent unknown economic laws.

COST OF SILK GOODS.

The question of cost, correct solution of which is so essential to the success of any manufacturing enterprise, is a particularly difficult one to solve in a textile mill making a number of different fabrics.

The rapid increase of silk mills in recent years has not been accompanied by a corresponding increase in knowledge on this important subject of cost calculation. Mills have been started, and the cost of the goods left in great measure to guess-work. Generally when a manufacturer guesses at the cost, or relies on crude rule-of-thumb methods, he places the estimate much too low. When he compares his guess with the market price, the apparent wide margin of profit leads him to believe that a fortune awaits him, if a large production is turned out of the mill, and this delusion is not removed until the affairs have reached such a state that a meeting of the creditors is found necessary.

The failure to properly appreciate how much a yard of silk cloth costs, is generally due to ignorance of the cost per yard of what is called general expense.

The cost of labor and supplies for the direct manual operations of manufacturing, are easily estimated with a fair degree of accuracy. It is somewhat difficult for any intelligent man with a common school education, to make any serious error in an estimate of the cost per yard for throwing, winding, doubling, quilling, warping, twisting, weaving and finishing. The expense of these operations is well defined, and does not vary materially from week to week.

On another page will be found an estimate of cost blank now in use by a successful silk mill, and which enables the cost of the various operations to be readily calculated and combined in one total showing the cost per yard.

The cost of the various processes can readily be calculated, but not so with the item of general expense. The first question is: What is meant by the term,—general expense? All will readily agree that such items as cost for interest, rent, fuel, taxes, insurance, salaries, watchmen, engineers, machinists, etc., are general expense, but is this all? In each department there are many employees, such as overseers, second-hands and general helpers, whose wages do not vary with the production. While their services are confined to one process, their wages are fixed and consequently are as much a general charge as is the rent of the mill.

At the same time it may be found that in some cases including such expenses in the general expense account, will result in placing the cost estimate on some classes of goods too high by reason of charges being included for fixed charges on processes which the fabric in question does not require.

We will illustrate this point by one illustration: A mill may be making piece-dyed goods and also fabrics that are manufactured from yarn purchased in the colored state. Obviously if the general expense account was made to include the dyer's salary as well as other permanent charges of the dye house, it would result in placing the estimate on the goods made from yarn purchased in the colored state, too high (as the last named goods require no dyeing), while at the same time the estimate on the piece dyed goods would be too low owing to the fact that a portion of the expense for dyeing is included in the general expense, and thus charged to cost of other fabrics.

Generally it will be found best to include such charges as those for overseers, second-hands, etc., in the process to which they belong, and confine the fixed expense account to the broad general charges of the mill. The special conditions in each mill must determine what course is to be pursued.

Only general principles can be laid down in this article as we are ad-

dressing the trade in general, including all manufacturers of silk goods. The fact which many mill owners fail to properly appreciate is the large increase in cost of general expense per yard, which accompanies a reduction of the production.

Men who plan a mill enterprise are generally desirous that the enterprise shall "go through," and for this reason figure invariably on a production either equal or in excess of what is possible.

A loom can weave 10 yards per day, they argue, therefore 500 looms will weave 5000 yards per day, which at 4 cents per yard profit (the difference between their estimated cost per yard based on a daily production of 5000 yards, and the market price), shows a profit of $200 per day.

The next step in this line of thought is easy. One thousand looms would return a profit of $400 per day, and why be so false to the interests of the stockholders and the community as to deprive the former of the other $200 per day, and the latter of the increased business which such an enlargement would bring to the town? This is the theory.

In practice, we generally find the production at its maximum to be much less than the enthusiastic estimate of the promoters, while for a large part of the time there is a greatly reduced production caused by the innumerable circumstances constantly arising to vex the mill manager, and thwart his plans. The experienced manufacturer knows that the theoretical production can never be attained, much less maintained. He also knows of the heavy increase in the cost of fixed charges per yard which accompanies a reduced production.

The moment a mill is started, there begins an uninterrupted series of events to interfere with the theoretical production. There are holidays, break downs of machinery, lack of sufficient help, sickness of employees, inferior work due to innumerable causes, and last but not least, lack of orders.

How many mill owners realize how much a reduction of 25 per cent from the theoretical production means in the cost of goods per yard? Moreover, it is not uncommon to have a mill operating for weeks at a time with a production fully one-half less than that which theory promised.

This, then, is the important and difficult part of cost calculation. To avoid the serious error of making the estimate too low, care should be taken to include in the fixed charges every item that the peculiar conditions of each mill will allow. Then base the estimated yardage of each fabric not upon the greatest product that any one of the mill departments can handle, but upon the product which the weakest department in the mill is likely to turn out, making a fair allowance for all the influences which foresight can disclose.

If the result is disappointing, if the estimate so reached shows a probable loss instead of profit, consolation may be found in the thought that forewarned is forearmed, and that an estimated loss on goods not yet made, can be avoided by not making the goods. This action may result in the shutting down of mills, and the abandonment of proposed mill enterprises, but will be much more profitable than the headlong plunging into the production of silk fabrics, which we have recently witnessed, and which is now being accompanied by the inevitable consequences of depression and loss.

—An action for damages brought by a weaver against an English railroad company, and recently decided in favor of the plaintiff, was based on the fact that the train in which the weaver was going to work at 5.43 a. m. was detained 22 minutes on the road, and when the plaintiff reached the mill, he was not allowed to start work that day. The judge awarded damages for $1.10, the amount of one day's wages.

Notes of the Month.

—The reckless disregard of the inevitable effect of an increased supply upon the selling price of a product, exhibited by promoters of Southern cotton mills, is well illustrated by the following extract from a recent address by a Southern promoter:

"I put the increased value of the 500,000 bales of cotton raised in this State at the following figures: As raw cotton, $15,000,000; as sheetings, at 18 cents, $45,000,000; as plaids, at 24 cents, $60,000,000; as ginghams, at 30 cents, $75,000,000; as dress goods, at 60 cents, $150,000,000; as muslin, at $1.20, $300,000,000; as dotted swiss, $1,000,000,000; as Swiss embroidery, $5,000,000,000. How can these values be obtained? I answer, by giving the facilities to our youth necessary to learn how to make these goods."

After this statement has been delivered in impressive style, the hearers are ready to subscribe liberally for the capital stock of a new cotton mill, to make anything from sheetings to Swiss embroideries, and without a thought as to the effect that the addition of five thousand million dollars' worth of Swiss embroideries would have upon the price of that commodity, or the utter impossibility of getting skilled help to make the goods, even if they could be sold. As a means of securing subscriptions for mill stock, this appeal, however, is a success.

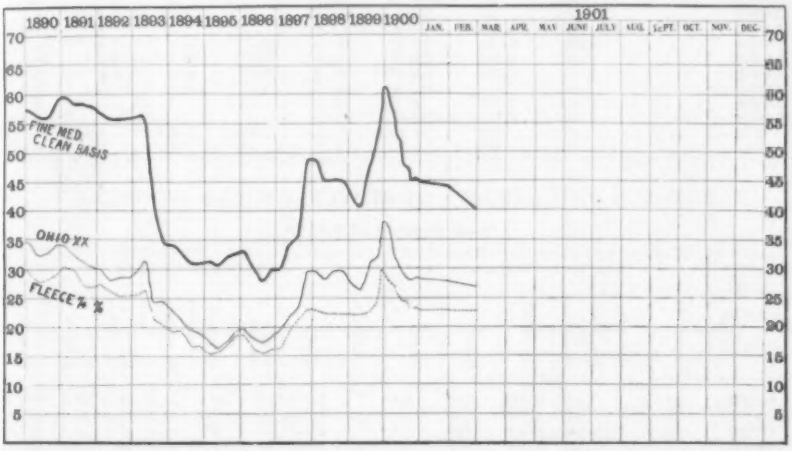
—Taking the figures relating to Swiss embroideries as a basis, we find the claim made that by manufacturing the cotton grown in a single state, into these goods, practically five thousand million dollars would be added to the wealth of the state. The wages of the workers making these goods in Europe will average say three hundred dollars per year, and as the estimated increase in value is nearly all represented by labor, this means that over sixteen million workers would be required to turn the 500,000 bales of cotton into Swiss embroideries, to say nothing of the additional number required to feed, clothe and house these lace makers.

—A large quantity of laces and similar goods are now coming from Europe to the United States, amounting in the year ending June 30th, 1900, to over $19,000,000. This is approximately the quantity comprising all kinds of lace goods annually consumed in the United States; and yet the Southern promoter in order to secure subscriptions for the stock of new mills, talks of manufacturing a quantity of Swiss embroideries alone, which would be two hundred and sixty-three times the value of all the lace goods consumed in the United States. At the present rate of consumption of all kinds of lace goods, it would take the people of the United States 263 years, or far into the twenty-second century before they could consume the Swiss embroideries which this speaker proposes to manufacture in one year. This is a sample of the line of argument which is leading to the construction of new cotton mills in the South.

—Recently a yarn commission firm sued a weaving concern for damages resulting from the refusal of latter to accept delivery of yarn ordered. The goods were subsequently sold to another party at a reduced price. The court awarded the yarn merchant damages equal to the difference between the original price and that at which goods were finally sold. Aside from the merits of this particular case, the decision calls attention to the peculiar position occupied by the weaver. If he accepts an order for cloth he is held strictly to the terms, providing it is for the buyer's interests to so hold him, but if for any reason it is desirable for the buyer to cancel orders or return goods, this is done with practically no redress for the weaver. On the other hand the contracts made by the weaver for yarn are enforced to the letter, as is shown by this decision of the court, while it is a well known fact that the weaver has no practical redress for loss owing to the non-delivery of yarn ordered. Every weaver who buys yarn is familiar with the losses due to non-delivery of yarn on specified dates, which resulted

in cancellation of orders for goods. A contract should bind both parties, and doubtless the courts would enforce this construction of all contracts, but owing to peculiar trade conditions the weaver of woolen and worsted goods finds himself confronted by the conditions referred to.

WOOL MARKET.



We have to record still another month of depression and falling prices in the wool market. Liquidation has been actively in progress during February.

For some time owners of wool looked forward to the opening of heavy weight goods as an event likely to mark the turning point in the situation.

That opening is now a matter of history, and it is putting the case mildly to say that the business so far done in heavy weights is disappointing. The low prices at which heavy weights have been offered, has not induced buyers to take the goods. The mills have thus been left with small orders, and small as their stocks of raw material, at the mill, may be, it has been sufficient in many cases to cover the orders in hand.

A little over a year ago when wool prices were at the top notch, nearly everyone was bullish; now, with wool as low as it has been for nearly four years, the sentiment is uniformly bearish.

In the first case, the trade made a great mistake. Is it making a mistake now on the other side of the market? The extremes in the quotations for fine medium territory under the free wool tariff were 28 and 33 cents; today this wool is selling at 40 cents. This is relatively the weakest grade on the market today.

An inspection of the chart at the head of this column shows plainly that every upward movement on wool which has taken place during the past eleven years, started about the middle of the year.

This is due doubtless to the influence of spring clip coming on the market, which tends to depress prices early in the year.

It is difficult to find anything in the present market conditions to start any upward movement in 1901 earlier than the schedule of the past decade. The situation abroad shows little change

EXPORTS AND IMPORTS OF RAW WOOL, YARN AND WASTE.

Lbs. in units of one million. Value in units of $100,000.

Year Ending June 30.	Exports.		Imports.					
	Wool.		Wool.		Shoddy, Noils, etc.		Yarn.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
1890	.231	.335	106.3	152.6	5.0	20.5	3.5	19.9
1891	.291	.394	129.3	182.4	1.2	4.3	2.0	11.9
1892	.202	.306	148.7	196.9	.3	.9	1.3	7.5
1893	.091	.148	172.4	210.6	.3	1.1	1.2	6.9
1894	.520	.906	55.2	61.1	.1	.5	.5	3.6
1895	4.289	4.844	192.8	229.9	14.1	19.8	2.4	11.7
1896	6.945	8.559	228.4	315.0	18.7	26.5	2.0	10.5
1897	5.271	6.199	366.6	567.5	49.9	69.3	1.8	9.6
1898	.121	.180	132.8	167.8	3.3	6.9	.3	1.9
1899	1.663	2.373	76.7	83.2	.3	.7	.2	1.1
1900	2.200	3.872	155.9	202.6	.4	.9	.2	1.3
6 mos.	.107	.115	44.0	53.9	.358	1.080	.105	.702
Jan.	.018	.018	9.2	10.6	.048	.16	.028	.15

EXPORTS AND IMPORTS OF MANUFACTURED WOOLENS.

Value in units of $100,000.

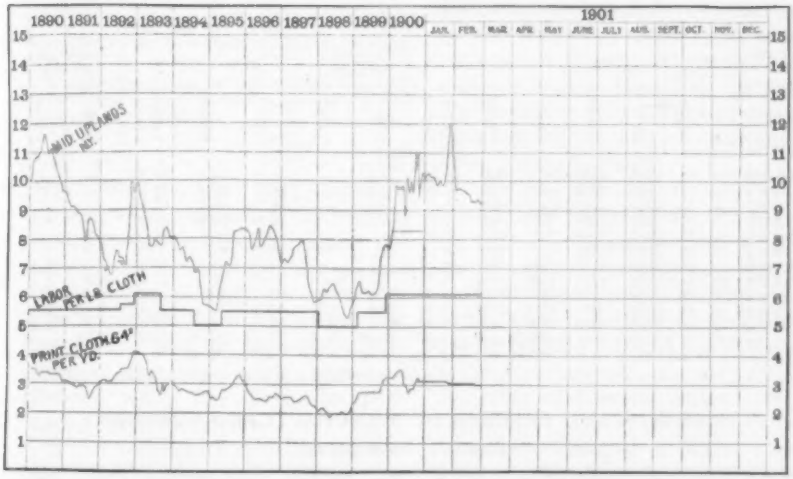
Year Ending June 30.	Exports — Value.						Imports — Value.							
	Carpets.	Dress Goods.	Flannels and Blankets.	Apparel.	Other.	Total	Carpets.	Cloths.	Dress Goods.	Shawls.	Clothing	Knit Goods.	Other.	Total.
1890	.067	..	.409	3.179	.719	4.374	7.5	161.4	242.0	10.1	18.4	19.8	66.2	525.4
1891	.184	..	.265	4.240	.502	5.191	13.7	120.3	182.4	7.2	18.6	12.5	39.7	394.4
1892	.093	..	.244	2.689	.649	3.675	12.9	127.6	164.7	3.5	14.8	11.6	12.1	347.2
1893	.115	..	.242	2.224	.679	3.260	15.8	151.2	164.8	2.8	11.7	14.1	12.0	372.4
1894	2.500	..	.387	3.172	1.685	7.744	9.6	67.6	85.8	1.6	8.6	10.0	7.2	190.4
1895	1.610	..	.498	3.161	1.432	6.701	13.6	163.0	144.0	2.0	10.0	9.4	11.8	353.8
1896	2.252	..	.370	3.653	2.860	9.135	8.9	218.9	199.3	4.5	13.0	25.4	27.4	497.4
1897	1.895	..	.573	3.858	3.150	9.476	7.8	170.1	167.9	4.6	9.8	25.3	27.0	412.5
1898	1.612	.414	.474	4.290	4.074	10.89	17.9	33.6	60.4	.4	7.6	3.9	9.6	139.4
1899	.811	.169	.427	5.388	3.679	10.47	17.6	39.1	59.1	.5	8.3	6.3	5.6	136.5
1900	1.150	.244	1.002	5.654	4.485	12.54	27.5	51.3	58.7	.8	9.9	5.0	6.3	159.5
6 mos.	.471	.040	.583	3.969	3.107	8.17	13.57	21.71	24.95	.51	7.29	2.69	2.61	73.33
Jan.	.110	.044	.165	.578	.255	1.15	1.98	5.57	8.21	.02	.34	.12	.59	16.83

--The Department of Labor of the French Government reports that the situation in the cotton industry is stationary, orders being fairly abundant, but in certain industrial centres the mills are working but four or five days per week. The improvement in silk manufacturing has been maintained, new orders coming in quite freely. The worsted combing and spinning industries show some signs of improvement, which, however, is not shared by the weavers, who find it difficult to contend with the high prices of raw material and the low price of goods. The situation is stationary in ribbons, knit goods, embroidery, laces, and in the dyeing and finishing works. The report estimates that eleven per cent. of the weavers in France are idle.

—A party in Philadelphia has for several months been sending out circulars promising enormous profits to those who would send him money to invest at his discretion in cotton futures. He used the names of William V. King, Supt. New York Cotton Exchange; Thomas Ellison, of Liverpool, and A. B. Shepperson of New York, men well known to the cotton trade, in such a way as to lead people to think that these gentlemen endorsed his methods. Each one of the three have disclaimed any such endorsement. To make a long "story" short, this is an attempt to apply the familiar syndicate scheme, using cotton instead of stock speculation as a cover.

--Wool spinning has been carried on in Mexico since 1541.

COTTON MARKET.



The cotton market during February has been featureless. Following the culmination of the January corner at New York, prices quickly dropped to 9½ cents and have since been weak, exhibiting little rallying power.

The bearish sentiment has been strengthened by the condition of the goods market, both at home and abroad. The heavy stocks of yarn and manufactured goods have forced a much needed curtailment of production.

The fact has been brought home to cotton manufacturers that something more than building mills and turning out goods is required to bring success; that something is selling the goods.

The accumulated stocks necessitated either an increased outlet or diminished supply; as the first was not forthcoming, the manufacturers, particularly in the South, where mill expansion has been so rampant, enforced the second.

This remedy is always within reach of the mill owner, and the pity is that he generally postpones its adoption so long. The tardy curtailment, which has taken place, has weakened the price of raw material.

Advices abroad have been unsatisfactory. The trade apparently has forgotten the scarcity of last summer, and can think of nothing else now except idle mills and an enormous acreage for the new crop.

We have the first, and doubtless will have the other; but the normal consumption of cotton goods, aided by a reduced supply, would soon wipe out the accumulated stocks of goods.

The size of the present crop is still an unknown factor, and bearish sentiment has pictured large quantities of the staple held back in the South.

The Chronicle reports the visible supply on March 1st as 4,047,890 bales, compared with 3,952,563 bales at same date in 1900; 5,416,325 bales in 1899, and 4,890,819 bales in 1898.

—Germany has over 8,000,000 cotton spindles in operation, and is entirely dependent upon foreign countries for raw material to supply this machinery. During the year ending June 30, 1900, the United States sold to Germany cotton valued at $63,476,825. Disaster to German industry would follow the cutting off of this supply, and German commercial associations are petitioning the government to encourage the cultivation of cotton in German colonies.

EXPORTS AND IMPORTS OF RAW COTTON AND WASTE.

Lbs. in units of one million. Value in units of $100,000.

Year Ending June 30.	Exports.									Imports.				
	Sea Island.		Other.		Total.			Cotton Waste.		Raw Cotton.			Cotton Waste.	
	Lbs.	Value	Lbs.	Value.	Lbs.	Value	Value. per lb.	Lbs.	Value.	Lbs.	Value.	Value per lb	Lbs	Value
1890	9	23	2462	2486	2471	2509	10.15	..	..	8.6	13.9	16.16	..	..
1891	14	31	2893	2876	2907	2907	10.00	..	..	20.9	28.2	13.49	..	..
1892	19	16	2926	2568	2945	2584	8.77	..	..	28.7	32.1	11.18	..	..
1893	8	17	2204	1870	2212	1887	8.53	..	..	43.4	46.9	10.80	1.9	.8
1894	14	29	2669	2080	2683	2109	7.82	..	..	27.7	30	10.83	2.7	.9
1895	15	28	3502	2021	3517	2049	5.82	..	..	49.3	47	9.53	2.9	1
1896	19	38	2316	1862	2335	1900	8.13	..	..	55.3	66	11.93	6	2.1
1897	21	41	3082	2268	3103	2309	7.12	..	..	51.9	59	11.36	5.3	1.7
1898	16	28	3834	2277	3850	2304	5.98	19.1	7.9	52.7	50	9.48	6.7	1.5
1899	14	24	3759	2072	3773	2096	5.55	21.1	8.3	50.3	50.1	9.98	6	2.1
1900	18	30	3082	2388	3100	2418	7.80	38.6	17.7	67.4	79.6	11.81	7.9	2.4
6 mos.	3.4	7.5	1833.3	1785.6	1836.7	1793.1	9.76	27.05	14.41	20.84	29.96	14.37	3.19	.97
Jan.	1.83	3.7	367.6	354.8	369.4	358.5	9.75	4.94	2.52	5.59	8.66	15.5	.48	.15

EXPORTS AND IMPORTS OF MANUFACTURED COTTONS.

Value in units of $100,000.

Year Ending June 30.	Exports — Value.					Imports — Value.							
	Colored.	Uncolored.	Apparel.	Other.	Total.	Colored.	Uncolored.	Apparel	Laces, etc.	Thread.	Knit Goods.	Other.	Total.
1890	29	55	2	14	100	33.7	1.3	3.4	114.5	9	71.5	65.8	299.2
1891	26	93	3	15	137	42.4	1.7	12	105.9	8.6	67.4	59.2	297.2
1892	25	87	4	16	132	45	1.4	12.6	112.5	6.6	58.3	46.7	283.1
1893	28	63	5	22	118	55.4	2.6	16.8	127.4	7.6	63.9	61.8	335.5
1894	38	76	5	24	143	33.8	1	16.6	80.2	3.3	43.6	45	223.5
1895	35	70	5	28	138	54.3	1.2	27.7	116.9	6.6	65.4	59.9	332
1896	34	95	7	32	168	49.2	1.8	26.8	108.8	8.7	61.9	67.1	324.3
1897	48	125	9	29	211	44	2.7	26.3	125.7	6.5	56	83	344.2
1898	41	92	9	25	167	53.1	1.2	10.5	117.7	6.9	40.3	42.9	272.6
1899	52	138	13	30	233	66.5	1.1	10.3	145.5	8.5	43.4	45.3	320.6
1900	48	132	16	37	233	81.6	3.6	12.4	192.1	21	47.2	55.3	413.2
6 mos.	27.18	28.46	7.97	15.71	79.32	25.66	.99	7.16	99.98	9.54	22.54	28.76	194.73
Jan.	4.95	3.41	1.11	2.57	12.04	12.48	.23	1.25	22.16	1.36	4.99	3.72	46.12

Saxony contains a population of less than four millions. One-third of these people are engaged in textile manufacturing, and produce at least one-third of the textiles manufactured in Germany.

Saxony is not favorably situated for manufacturing. The location is far inland, and the raw material—wool, cotton, silk and linen—must be carried thousands of miles to Saxony's mills. In spite of these natural obstacles, Saxony manufactures not alone for Germany, but for every part of the world.

Her development is a striking example of the results from technical education of such a people. German industry, physical and mental power, combined with a high degree of technical education, has made Saxony a workshop for the whole world.

This success is not alone due to the schools, nor to the people themselves; it is the combination of the two which brings success, and points to other nations the path to similar results.

—A patent has recently been granted for an attachment to the ordinary jigger dyeing machine. While the goods are passing from one roll to another, the dye liquor is kept in circulation by a centrifugal pump and suitable connections. The liquor is heated by steam, introduced into the pump, and additional dyestuff is added in the same way.

Humidity: Its Importance in Wool Manufacture.

EDWARD W. FRANCE,
Director of the Philadelphia Textile School.

A paper read before the National Association of Wool Manufacturers, at its Thirty-sixth Annual Meeting.

Of all the many problems with which the merchant and manufacturer of woolen materials has to deal, one of the most important and I believe least understood by the rank and file is the hygroscopic nature of the fibre in relation to its commercial valuation, and also the influence of this property on the many processes through which the fibre must pass during its manufacture.

It is a well-known fact that all textile fibres possess this affinity for moisture to a greater or less degree, but the wool fibre, it seems, possesses this quality to a far greater degree than either of the other fibres. By the hygroscopic quality of wool is meant the power by which wool is capable of absorbing a considerable amount of moisture without in the least altering its external appearance. The amount of moisture which may be present in the fibre at any one time will be largely dependent upon the physical condition of the fibre together with the temperature and humidity of the atmosphere.

Notwithstanding the great influence this hygroscopic property has upon the weight of wools and wool products, it is only within the last few years that any serious attention has been given to this important subject by the wool manufacturers and merchants of this country, and then only by a few who may be termed the leading ones; while on the other hand the foreign manufacturers and dealers have been giving this question the closest of attention for many years.

I believe it is the raw silk industry of Europe to which we are indebted for the first steps which were taken in this direction, although the silk fibre does not possess the affinity for moisture to anything like the same degree that wool does, yet so important a bearing has it upon commercial transactions in so high-priced a fibre as silk that today there exists in all the principal European centres of the industry what is known as conditioning houses, where this hygroscopic condition of the fibre is determined when bought and sold.

The value and importance of these conditioning houses to the silk industry was soon apparent in the improved relations existing between the buyer and seller, and it was not long before such uniformity of regulation was considered to be of equal benefit to the wool industry. As long ago as 1857 these conditioning houses were in existence in France, the principal one being established at Roubaix. Belgium in 1860 established such houses and fixed by law the allowable percentage of moisture which the product of wool may attain when bought and sold by weight.

England in the early eighty's became cognizant of the fact that European buyers discriminated between her worsted tops and yarns and those of her continental competitors. Through a report of a Royal Commission, authorized by an act of Parliament to study the industrial conditions existing on the Continent, it was discovered that this state of affairs was due to the irregularities in weight of products from English mills, as compared with the authorized weights by continental conditioning houses. The result of this investigation led to the establishing in 1887 at Bradford, England, under municipal control, but by an act of Parliament, an official conditioning house, which has had a very beneficial effect upon this line of manufacture ever since. In order to fully understand the working of such a house, I deem it advisable to digress somewhat at this point and give a brief description (compiled from one of our Consular Reports) of this most useful adjunct to the English wool manufacturing industry.

The conditioning house at Bradford is modeled after institutions of a sim-

lar character on the Continent, particularly the well-known one at Roubaix, France. Some idea of the importance and proportion of this latter institution may be gained by citing the fact that no less than from 250,000,000 to 400,000,000 pounds of textile materials are conditioned annually.

The English house at Bradford, like that at Roubaix, is equipped with the most approved scientific appliances requisite for accurate conditioning of all classes of materials. Its location in this city was largely due to the fact that Bradford represented the centre, so to speak, of the English woolen industry, and particularly the worsted export trade, which trade was most directly effected by the discrimination of its continental competitors.

Although primarily established for the benefit of the export trade, the merchants and spinners were quick in recognizing its importance to the domestic trade, in that the certificates of this conditioning house were universally accepted as a basis of arbitration in the settlement of disputes arising out of claims for shortage. This is possibly from the fact that all the tests are carried out scientifically, and being legalized by an act of Parliament, its certificates are accepted as evidence in courts of law with respect to weights, condition, and descriptions of goods under dispute.

The conditioning, however, is entirely optional, but is customarily resorted to by both buyer and seller, their confidence being strengthened by the legal status of the establishment. In its scope this conditioning house is authorized to determine:

First—The average content of moisture present in wool, tops, noils, and yarns.

Second—The correct gross and tare weights of all cases, bags, bales, and packages of material.

Third—The true conditioned weights of samples of wool, tops, noils, and yarns, after scouring, cleaning, and drying.

Fourth—The correct counts, length, twists, and strengths of yarn.

Fifth—The measurement of length in all goods sold by the yard. All tests are made in duplicate; the results and calculations are worked out by separate methods and persons. Thus every precaution is taken to secure the most accurate results. A certified report is then made, which is strictly confidential, for the merchant or manufacturer for whom the tests are made.

The testing for the amount of moisture is carried out by ascertaining the absolute dry weight of the samples, to which is then added the standard percentage of moisture in order to give the true invoice weight. This standard is supposed to represent the amount of moisture absorbed by the fibre under average normal conditions of humidity and temperature; the average normal conditions having been determined by scientific verification covering a period of one year in the north of England. The allowance for regain as authorized by the Bradford Conditioning House on different wool materials is as follows:

Wools	16 %
Tops combed with oil	19 %
Tops combed without oil	18½%
Noils	14 %
Worsted yarns	18¼%

The allowance for regain of moisture allowable by the Continental Conditioning House at Roubaix on wool and wool materials is as follows:

Wools	14¼%
Tops	18¼%
Wool yarns	17 %

All necessary expenses for making these tests are of course borne by the party having the tests made.

The conditions of humidity in the United States are not the same as they are in England, and consequently materials imported into this country from England will show considerable difference in weight, proportionate to the difference in climatic condition of the two countries; that is, material

will lose in weight on this side of the Atlantic because of a less amount of humidity in the atmosphere, and often the American importer will be at a loss, owing to the fact that the standards adopted in England and on the Continent are not representative here.

This will be best illustrated by stating a little instance which happened in Philadelphia during the first year of the workings of the so-called "Wilson Bill," or free wool law. Shortly after the law became operative, representatives of foreign top makers appeared in the market with the purpose of making sales of their wool products --tops. Each solicitation of sale would be accompanied by the statement that they would agree to furnish you with a conditioning house certificate, explaining at the same time the meaning of the same.

That was an innocent-looking statement; it looked at first as though you would not be required to pay for any more than you actually received. Sales were made, and I am informed of one manufacturer who secured upwards of 50,000 pounds of tops with the conditioning house certificate attached. They came to this country and stood for a few months, and when they were brought out and weighed up they were found to be about 6 per cent. short in weight. When the buyer hunted up the broker from whom he had purchased the tops, he found out that the conditioning house certificate, upon which he had relied, simply meant that he had bought the tops at the percentage of regain which was allowable by law on the Continent, and he was compelled to pay for his 18¼ per cent. of moisture.

The merchant or manufacturer who through necessity is forced to procure his wool from Europe is in as bad or worse condition than he who purchases his wool in this country, as far as the question of moisture in wool is concerned, for no matter how well he may be versed in this subject, and assuming that he has purchased his wool on a certificate from a conditioning house, and had further been allowed a percentage on the difference between the normal humidity, as existing at the time and place of purchase, and the percentage which is acceptable on the Atlantic seaboard of the United States, nevertheless he is still at a disadvantage, since the government here does not recognize this hygroscopic property in wool when fixing the duty on the wool as it is landed on our wharfs.

For illustration, take wools that are shipped from Australia, via London to the United States, to be transshipped in London. The steamship company which carries the wool from Australia to London charges freight on the gross weight of the wool as it left the Australian port. When it is discharged from the Australian steamer in London for shipment via some line to an American port, the usual custom is for the line coming to America to reweigh this wool and establish a basis for its freight charges, or to allow the shipper to add 2 per cent. to the gross weight as shown on the Australian invoice, thus making a new basis for freight charges to the American port. This addition of 2 per cent. to the Australian weight, or the increased actual weight, which may be found by reweighing, is solely a gain in weight by the absorption of water in transfer.

The custom house weighers weigh every bale, and the custom house officers collect the duty on the face of the invoice, after which a supplementary bill is rendered for the difference between the face of the invoice and the actual weight as found by these custom house weighers. The government then claims this difference at 11 or 12 cents per pound, and the shipper is forced to pay so many cents per pound on the water absorbed from Australia or from London to the American port. There is no need of protest, as no rebate will be given, and as the case stands now there is no resource of any kind for the shipper.

When this wool goes into any of the

American mills along the Atlantic seaboard, and is exposed to the average normal humidity of the Atlantic coast, it will in most cases return to about the weight of the Australian invoice if shipped in the summer time, or to the London invoice if shipped in the winter time. This question does not only apply to wool as a raw product, but to the finished yarns and semi-finished products of tops, and also by-products and remanufactured products composed of wool. Indeed, it is a more serious question when considered in relation to these latter products than to the raw wool.

For illustration I will quote you a little instance of a merchant who was selling the by-product of a mill to a manufacturer in Philadelphia. This merchandise went into a store of a Philadelphia merchant and was kept on the upper floor of his building. It then went into the mill and was kept in one of the steam-heated rooms in the mill.

The manufacturer was in the habit of taking from the merchant this merchandise on the merchant's weight for years. One of his superintendents began to weigh the material as they used it, and did so for two or three months. He found that the material as it went to the machinery was lighter in weight per bag than when it came from the merchant. He made claim on that lot, and in addition made a claim on all of this material the merchant had delivered to him for years back.

After considerable controversy it was agreed to refer the matter to a reputable manufacturer who had had considerable experience particularly in the line of raw materials. The referee asked the manufacturer if his experience had ever led him to consider the question of humidity in the materials he purchased, and was he aware that such contained anywhere from 12 to 18 per cent. of moisture. He said "No." He was further asked if he had not bought the material under the usual custom recognized in the trade, and he stated "Yes." Both the manufacturer and the merchant agreed that the material was sold under the usual custom, and that the custom had been followed out in every particular.

The manufacturer made the complaint that in all these years he had been paying for so many pounds of water per bag of wool, upon which he had not reckoned, and had thereby lost all the profit he had calculated on, that it was not just that he be asked to pay for the difference of weight in the material between the time of purchase and time of manufacture. The referee stated that as the custom of the trade had been followed out in every particular that no court in the land would recognize his claim, and that there was only one thing for him to do, namely, to conform to the custom of the trade in the matter of purchase, and settle the account. As a result the manufacturer agreed to withdraw his claim for all past shortage, and an equitable settlement was made for stock on hand.

The above illustration is only one of many which have come under my observation or attention, and proves that some of our manufacturers have but very little conception, if any, of this important question, and in many instances I am quite sure that calculations have been made as to costs that through neglect of this particular knowledge have caused losses to be sustained which were charged up to some other cause or reason, and charge appeared finally in the profit and loss account.

Due to the fact that there is no official recognition or regulation governing this varying and uncertain condition to which wool products which are sold by weight are continually subjected, there results constant confusion and misunderstanding between manufacturers and their customers.

It is no stretch of the imagination to assume that some manufacturers will take undue advantage of the latitude allowed for the variation in moisture, and thereby make prices on their

products which are not representative of their true value, and it is partially due to this fact that certain of our leading worsted manufacturers have been compelled to adopt definite standards to which their products must conform, and by which they sell.

From experimentations made by the firm of Erben, Harding & Co., of Philadelphia, since 1884, the normal percentage of humidity was found to average about the same as that found by the Arlington Mills, which proves that this standard may probably be taken for the normal average of the eastern seaboard of the United States.

While the selling of their materials with a certain percentage of regain for moisture is just and fair between these firms and their customers, it does not, however, give them the proper protection with regard to their competitor, because a lower price per pound on standard materials can be quoted, and the difference in price can be covered by additional moisture. This condition of affairs could be easily remedied, and a uniformity of trade conditions could be arrived at by establishing legal conditioning houses.

There seems to be no reason in my mind why we should not have them in this country, except that the manufacturers have not united in calling the attention of Congress to their necessity. There is little doubt but that the Congress of the United States, if it were informed of the general consent of the manufacturers to a standard form of humidity, would take measures to provide a standard for the delivery of woolen and worsted products sold by weight, which would be as well known as our standards of money and our standards of weights and measures.

While we perhaps could not expect that these conditioning houses could be placed in all of the different wool purchasing centres, yet for foreign wools, yarns, etc., and for the manufactured products in this country, the larger part of which is made along the Atlantic seaboard, one conditioning house in New York, one in Boston, and one in Philadelphia, under the federal law of the United States, and governed somewhat after the plan as in common use in Bradford and the Continent, would I believe, be of inestimable value to the manufacturing interest, especially those of wool.

Up to this point this question of humidity has been dwelt with simply from the commercial standpoint, but upon further investigation you will find that it is also a question of prime importance in the technique of all wool manufacture. Especially is this true in the worsted branch of the industry, where its influence must be calculated with in all the processes of carding, combing, drawing, and spinning, both from the point of maintaining a regularity in sizes of numbers or counts, and in order to preserve the good spinning qualities of the fibre itself.

It has long been a recognized fact that moisture and temperature are two important factors in the proper regulation of the spinning or of otherwise manipulating the cotton fibre, and much stress has been laid on the suitability of one district over another for purposes of cotton spinning, on account of the proper atmospheric conditions which may exist. Apparently a high degree of humidity is most favorable, together with narrow limits in the variations of temperature, these two conditions insuring the most satisfactory results, through their influence in reducing to a minimum the electrical charges which the fibre acquires during its manipulation, and in preserving the fibre in a proper state of softness and elasticity, most conducive to the best results in the manufacturing process.

While cotton depends so largely upon atmospheric conditions for its plasticity, wool is artificially treated with oils and lubricating emulsions to give it, in a measure, the required pliability, nevertheless experience has demonstrated that humidity plays a part of almost equal importance in

tile wool manufacture as that of cotton. This is evidenced by the fact that up to within quite recent times it was generally thought by those skilled in the art that certain qualities of wool could only be spun to their highest possible numbers in worsted yarns in localities where the humidity and other atmospheric conditions were of a specified nature.

Sir Henry Mitchell, a recognized expert in the English worsted trade, when appearing before a Royal Commission in 1885, gave the following testimony. "I do not think Americans will ever be able to make yarns as good as we can in this country. The climate in the United States is very unfavorable for the spinning of worsted yarn. The very great changes which take place, the intense heat in summer and the intense cold in winter, are very unfavorable to the spinning of worsted yarn. A moist climate is more suitable for them."

Sir Henry Mitchell overlooked the fact, apparently, that nature may be tempered by art, and he was evidently not fully cognizant of what was being done even at that time in the cotton industry of England to artificially control the conditions of humidity in the atmosphere, for notwithstanding the fact that Lancashire, England, was considered as one of the most favored of localities for cotton spinning, yet even manufacturers in that district, in some instances, resorted to methods of injecting steam into various departments of their mills in order to achieve as nearly as possible a uniform condition of humidity.

Ever since the important role which humidity plays in the spinning industries has become recognized, this practice of artificially tempering the various conditions of nature to the requirements of textile manufacture has had more and more attention paid to it, with the result that various mechanical appliances have been perfected for the proper regulation of the humidity of the air in our textile mills.

If we regard this question of humidity in respect to the maintaining of a regularity in the counts of numbers of yarn passing through the process of manufacture, it will at once be seen that proper results can only be attained by preserving a delicate adjustment in the amount of moisture contained in the fibre. If this amount varies without due allowance being made for it, a proportionate variation will occur in the respective count which it is desired to produce. Some manufacturers in order to ensure uniformity of their product make daily tests for moisture in their materials during the various stages of manufacture, and any variation in the percentage is corrected by a corresponding correction in the humidity of the room in which it is being worked.

We do not wish to be misunderstood, however, in this latter statement that corrections in size of materials are simply made by the increase or decrease of moisture. What we do mean is that the material is tested for moisture, and the aim is to keep a certain percentage of moisture at all times in the material, not only for good working quality, but so that in the finished product, when the full percentage of normal regain has returned to it, the counts will not be altered thereby. Again, the electrical influences are practically allayed and good spinning qualities are attained.

All that Sir Henry Mitchell, the English expert, said as to the reason why we could not spin fine worsted yarns in this country on an equality with England, namely, that our atmosphere was not moist enough, applies with equal force to the woolen spinning and to the worsted trade; and while it is a fact that the spinners of worsted yarn are recognizing more and more every day the benefits of a regulated and relative humidity in their work rooms, woolen manufacturers or spinners of woolen yarn as a rule have not awakened to its importance, at least so far as it relates to the installation in their mills of methods or devices for controlling the humidity of the atmosphere.

Oils and emulsions, it is true, do give a pliability to the stock while going through the cards so long as the degree of moisture can be maintained, but unless the heated card room wherein the stock is being worked is provided with some form of appliance for humidification evaporation is bound to take place and the stock will gradually become less and less moist, even to the point of becoming wild, so to speak.

This is one of the reasons why so many woolen carders resort to the use of steam jets on the fronts of the condensers, the use of which is proof positive that electrical influences are at work. It is no uncommon thing in the average card room to see fibres of wool so highly charged with electricity that they will adhere to all non-conducting surfaces in bristle like form, standing straight out at right angles to these surfaces. The reason of this phenomenon is that wool being a poor conductor, when in a dry state is easily charged with electricity, generated not only through the slippage of the belts and the friction of the machinery, but also from the rubbing of one fibre against another.

In this manner fibres become charged with different kinds of electricity, in consequence of which they repel each other, thus causing undue waste in carding, and also giving rise to much difficulty in the spinning operation, the fibres when in this condition not having affinity for each other.

In a moist condition the wool fibre is not so susceptible to electrical influences, and does not so readily become charged. These same electrical disturbances are even more noticeable in wool stocks which have been dyed certain colors than in those in their natural condition, and all sorts of tricks have been adopted by carders to endeavor to overcome the so-called electrical troubles.

Some find that the working quality is much improved by spreading the stock on a concrete floor for a day or two before using, others add an extra amount of emulsion, and still others introduce common salt into the emulsion with the object of preventing the electrical charges arising on the fibre. Another often practiced trick among carders, especially on cold frosty mornings, when the atmosphere is heavily charged with electricity, and the steam jets on the front of condensers do not yield the necessary relief,—the application being too local,—is to spray the rub rolls and aprons with water by means of a hand brush. This ofttimes gives temporary relief, but is not a good practice to resort to owing to the liability of swelling of the leather, aprons, and rolls, all of which goes to prove that the electrical disturbances in carding and spinning of the wool fibre may be prevented to a very large degree by proper atmospheric conditions of humidity as well as temperature.

It has long been conceded that the wool fibres should not be dried at too high a temperature after scouring or dyeing; indeed, the best condition for drying is the ordinary temperature which gives what is known as air dried wool, leaving the wool with its normal amount of moisture. Dried at higher temperatures there is danger of making the wool too dry, which always results in injury to the fibre.

Therefore, in all artificial methods of drying, it should be the aim never to reduce the amount of moisture below that which is normally present in wool when dried in the open air. This also holds true in the finishing of both worsted and wool fabrics, as too great a heat will often effect a serious injury in both the strength and handle of the goods. This should be a point of careful observance, and a definite amount of moisture should always be present in the fibre, for if more than a certain amount of moisture is abstracted from the fibre, it becomes altered in its physical properties, and its good qualities suffer severe deterioration. The elasticity is ruined, and the tensile strength greatly diminished.

Many of the just criticisms relative to the feel or handle of the finished

fabric are, without question, due to a lack of knowledge on this particular point. There is, however, another point to this question of moisture on finished goods, which strangely enough becomes a fault, not of omission, but of commission; that is to say, instead of abstructing more moisture than is good for the fabric, there has been a growing practice among some European manufacturers to increase the amount above the normal by adding to the fabric in the process of finishing various substances which have the property of attracting water. This is what is known as "loading" and bids fair to become a serious menace to honest manufacturers as well as to the purchasing public.

For instance, a piece of goods which ordinarily weighed 12 ounces per yard is raised to 14 ounces, a gain of 16⅔ per cent. It is claimed, however, that the feel and physical properties are not altered, but as goods are sold on a basis of weight, as well as on yardage, it becomes quite a factor in the hands of the unscrupulous manufacturer, and gives him an advantage over his honest competitor.

To such an extent is this adulteration being practiced in some parts of Europe that legislation has been called for with the hope of stopping this growing evil or at least regulating it.

I have touched briefly and hastily upon a few, but only a few of the practical problems in whose solution the question of commercial success or failure often turns, and to the profitable discussion of which the schoolmaster may hope to be able to offer an occasional contribution. That the school should be asked to do so, and that the school is coming to be regarded by hard headed business men as a source from which information and assistance in connection with the practical conduct of the factory and the mill is to be expected, is the momentous and significant fact in the history of modern education.

What has been said above in regard to the triumph of the trained mind over climatic disadvantages where worsted spinning is concerned, is quite as true in numberless other cases—of dyeing, for example, which used to be regarded, not so many years ago, as something which could be successfully carried on only in the neighborhood of certain rivers, or mill ponds, but which is now known to be a matter of intelligent mastery and judicious application of certain fundamental truths which chemistry has to teach. The fact is that the secret of industrial success is to a rapidly increasing extent becoming less and less a matter of natural aptitude and advantage, and more and more of scientific knowledge and disciplined skill.

This knowledge and this skill it is the business of the school to impart, and as the industrial world has only just awakened to a recognition of this principle, so we are only on the threshold of the progress which its recognition will render possible.

Industrial and commercial success are no longer to be expected, except as they are directed by trained intelligence of the kind which is developed, not by the haphazard experience of traditional craftsmanship, but by the systematic application of organized instruction. This truth is fast coming to be understood and applied, as it deserves to be, and it seems to me that influential bodies like this, which I have the honor of adressing today, can hardly render a more valuable service, to the common interest of which that of any individual member is only a part, than by promoting the welfare and increasing the efficiency of the Technical School.

Although we have only touched upon a few of the many problems of which humidity touches the manufacturers of wool and its products, there are many other ramifications of the subject which have been left out, due to a lack of time, and also from a desire not to overload this paper, as its main purpose is only to suggest lines

of thought which might call forth profitable discussion.

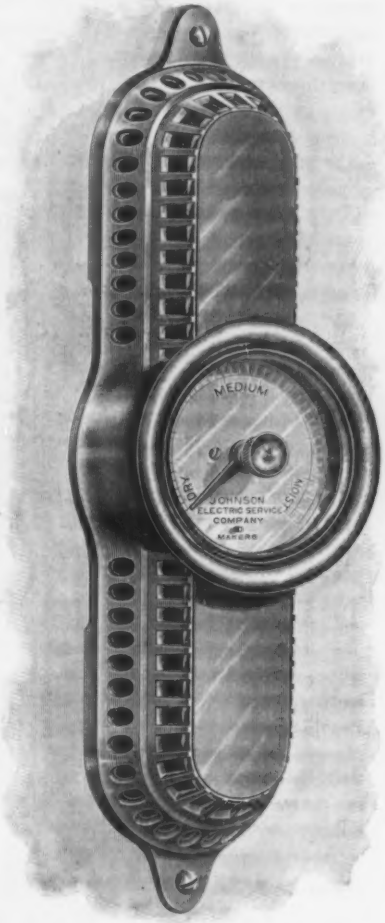
The Johnson Humidostat.

The development of air moistening has kept pace with the increasing knowledge of the effects of moisture in the atmosphere upon the different processes of textile manufacturing. These effects were better realized by cotton manufacturers than by those engaged in other branches of textile manufacturing, and for that reason we find the air moistening equipments of cotton mills far in advance of such equipments of the woolen and silk mills. This is true in spite of the fact that wool has a much greater capacity for absorbing moisture than has cotton.

The variations of humidity in the atmosphere affect the operations of woolen manufacturing to a greater degree than do those of cotton manufacturing. No up-to-date cotton manufacturer would think for a moment of dispensing with the artificial moistening of the air in the mill, and the apparatus for this purpose has come as much a part of cotton mill equipment as the cards or mules.

The present methods of humidification leave little to be desired. By means of humidifying devices now in use, the air in the mill can be kept at an even and uniform humidity. The necessity, however, exists of regulating the supply of moisture in accordance with the varying climatic conditions, in order that the degree of humidity should be kept uniform; in order to eliminate the human element in this regulation, a device has been invented by Warren S. Johnson, which automatically reduces or increases the supply of moisture, according to the varying conditions of humidity. Mr. Johnson is the inventor of the thermostat, which has given satisfaction for several years in regulating the supply of heat, and this humidostat is constructed on similar principles, and will doubtless prove equally serviceable.

By loosening the thumb-screw in the centre of the dial shown in the illustration, and moving the hand either to the right or left, the amount of moisture in the atmosphere can be regulated, it is claimed, within two degrees. After the manufacturer has determined the degree of humidity which he desires, he adjusts this hand

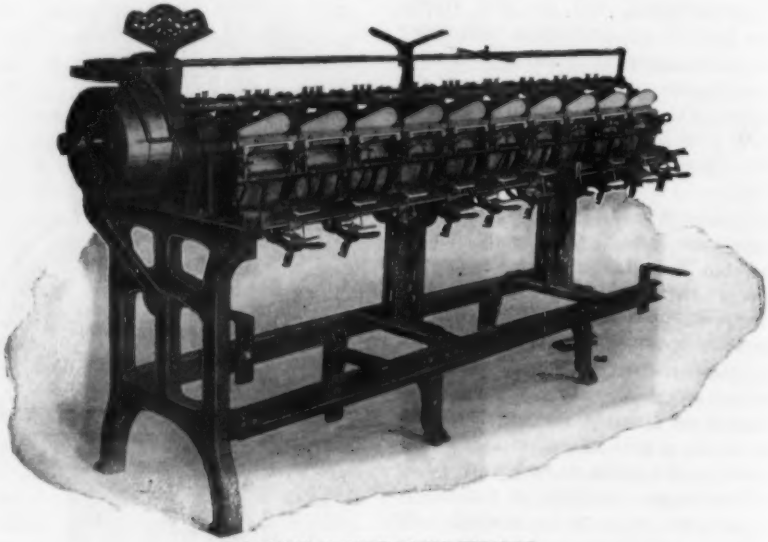


THE JOHNSON HUMIDOSTAT.

at the proper point, and the machine then does the rest of the work automatically, cutting off the supply of moisture when the humidity becomes too high, or increasing the supply when it falls below the desired point.

The dial of the humidostat is scaled to read from 30 to 75 per cent. of

moisture. Such a device cannot fail to be of great service to textile manufacturers. The wide variations of humidity due to natural causes, is a source of much trouble and bad work in our mills, and with the excellent devices for air moistening and this automatic regulator, it would seem as if the variations of climatic conditions would no longer plague textile manufacturers. The humidostat is manufactured and sold by the Johnson Electric Service Company, 120 Sycamore Street, Milwaukee, Wis., and 19 Pearl Street, Boston. They will be pleased to furnish additional information in regard to the apparatus and estimates as to cost of installation to anyone interested.



THE NEW FOSTER "1900" WINDER.

The New Foster "1900" Winder.

The accompanying illustration shows the new winder manufactured by the Foster Machine Company, Westfield, Mass. The manufacturers claim that this is the fastest running cone winder in the market, forming a well shaped cone, and that the machine is capable of turning out a very large production of the very best work.

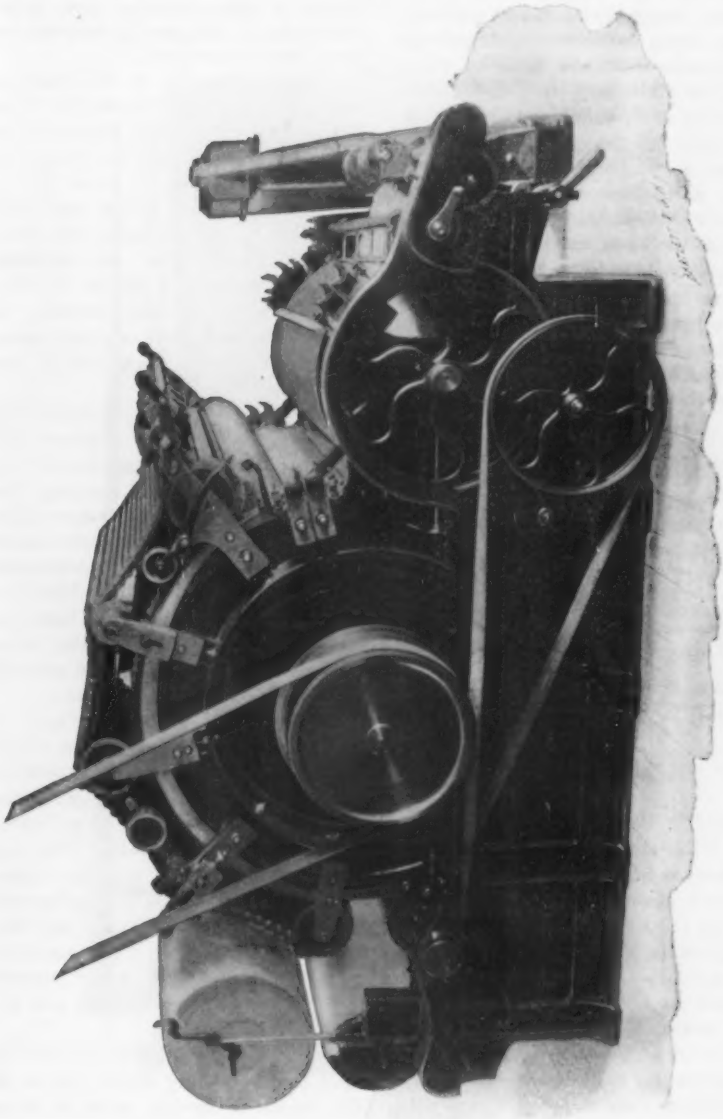
The construction prevents any oil or dirt from getting on the yarn while in process. The tension and speed are uniform, and it is claimed that very little power is required for its operation. The construction is simple and strong, consequently, the machine is not liable to get out of order, and will wear for a long time.

A stop motion is provided to stop the machine when a thread breaks or runs out. The cone is as hard at one end as the other, and the makers guarantee to wind as much yarn in the same space on their machine as can be wound on any other machine in use. There are no cross threads on the large ends to kink and break, and the cones do not need rewinding on wooden spools for knitting processes.

The shell rolls are made of hard wood, and need no covering. This, it is claimed, saves much expense over the rolls covered with leather. The rolls are strung on a shaft connected with the driving end of the machine and independent of the drum, so that the yarn has no contact with the cylinder. All that is required of the roll is to drive the cone, resulting in larger production with the same revo-

lution of the cylinder, while the yarn is wound in a more compact mass.

The Foster Machine Company ask manufacturers to give them an opportunity to prove their claims for the machine by reference to some of the largest and most reliable mills in the country, where the winder is giving complete satisfaction. Mr. G. E. Mancompany, is again connected with it, and will be pleased to explain personally to interested manufacturers the special features of the new winder.

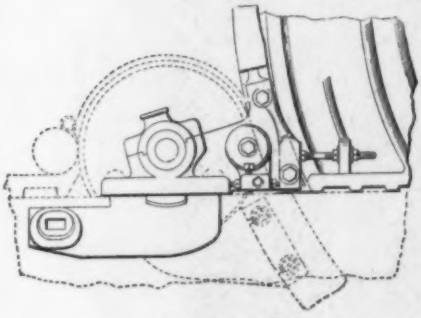


REVOLVING FLAT CARD.

Improved Cotton Machinery.

The Saco & Pettee Machine Shops, Newton Upper Falls, Mass., and Biddeford, Me., are constantly improving the various machines made by them, and they claim now that their latest improved card, shown in the illustration (Fig. 1), gives the best possible results in quality and quantity of work, percentage of waste, and cost of labor. These cards are built either 40 or 45 inches in width.

The 45-inch width has been found to possess many advantages, and was first adopted by English makers. The amount of carding surface is increased about fifteen per cent., while it requires about the same amount of labor



LICKER-IN BOX.

to operate the 40-inch cards that it does to run the wider machines. The advantages of the revolving flat cards are now generally recognized. They effect a reduction in the cost of labor, the yarn is more even, cleaner and stronger, less floor space is required, as well as fewer belts, less oil, and less power. The 40-inch cards are built with either a 24 or 27-inch doffer, while the 45-inch cards have a 27-inch doffer, and all are provided with 110 flats, the main cylinders being 50 inches in diameter.

Their licker-in (Fig. 2) is the result of long experience and many experiments. Each of its parts is separately adjusted on the licker-in box, and when once adjusted in the correct relation to the cylinder and licker-in, the whole device moves collectively, so that as the card wire wears, and it is found necessary to set the licker closer to the cylinder, one screw moves all of the parts, retaining the same mutual relation.

Attention is called to the improvement on the front and back steel knife blades, the front knife blades being both independent and collectively adjustable. Cylinders are made in one casting, making a strong and very rigid shell. This company has given particular attention to securing strength and solidity of the grinding rolls, upon the proper working of which depends to such a great degree the quality of the work done in the card room.

Their cotton coiler is of special design, and its special features are patented, and cannot be obtained on any other coiler. This company has patented a steel clip for fastening the card clothing on the iron flats, which they claim is a great improvement over the old style of clip. They are making an improved railway head, designed to even up much slighter variations of the sliver than could possibly be handled on the old machine.

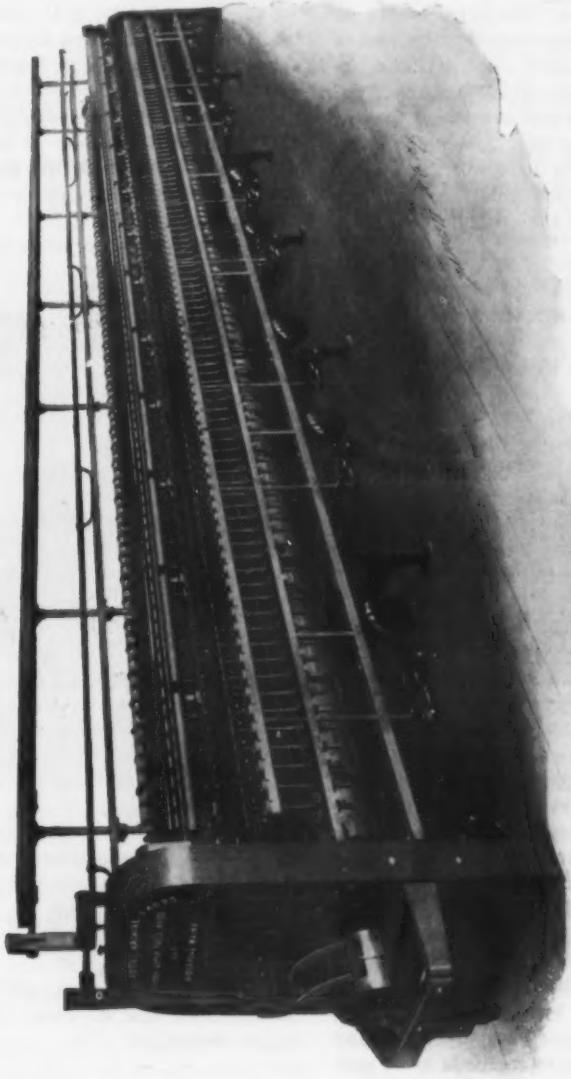
Their drawing frames are built so as to handle the uneven slivers on the card cans as delicately and yet as firmly as possible, avoiding undue tension, and delivering the sliver without kinks or bunches. Stop motions are provided to stop the frame, in case any sliver fails to pass through the rolls in a proper manner, and also when the can is full. The frames are built with improved roller stands, patent head end gear stands, and improved calender rolls.

They build a top clearer, so that the cloth can be readily slipped on or off the frame, or moved round so as to bring a fresh place in the cloth to appear on the top rolls, without taking out the wires or unstitching the cloth. The roving frame built by this company is well known to the trade, under the name of the "Biddeford" frame, and while many improvements have been added, the fundamental princi-

ples of the original frame have been retained.

The lifting arrangement is built so as to have the lift nearly under the centre of the load, resulting in a steady and easy movement of the roll. The differential motion of the old style compound device, which has been so thoroughly tested, is retained. The traverse motion gives uniform wear of top rolls, and it is claimed saves 50 per cent. of roll covering.

The spinning frames are built with double and single cylinders, and the construction of all the parts insures solidity and durability under a high rate of speed. The spindle used is said to be one of the very best of modern high speed spindles. One strong feature in connection with it, is



SACO & PETTEE SPINNING FRAME.

a loose lock step, wholly outside of the bearing tube, which is itself loose and locked in the outer case. It is claimed that these frames have the shank of the spindle blade made considerably longer than in any other form of modern spindle. The extra length of spindle below the main bearing, serves to keep the spindle erect, without impairing the essential movements of the bearings. The conical form of the upper part of the whorl, where the bobbin rests, tends to draw the bobbin down by centrifugal force to the larger part of the cone, in the same way that a belt goes to the larger part of a pulley, and the inside of the lower part of the bobbin is secured from injury caused by careless handling.

Some of the best cotton mills in the country have been equipped with machinery built by the Saco & Pettee Machine Shops. Among the many firms to whom reference is made may be mentioned the Border City Manufacturing Company's No. 1 Mill, the Seaconnet Mills, Merchants Manufacturing Company, all of Fall River; Skenandoa Cotton Company, Utica, N. Y.; Amoskeag Manufacturing Company, Manchester, N. H.; Fiskdale Mills, Fiskdale, Mass.; Nemasket Mills, East Taunton, Mass.; Pacolet Manufacturing Company, Pacolet, S. C.; Lanett Cotton Mills, Lanett, Ga.; West Point Manufacturing Company, West Point, Ga.; Pelzer Manufacturing Company, Pelzer, S. C.; (shown in the illustration); Laurens Cotton Mills, Laurens, S. C., (shown in the illustration); and many others.

—The world is a sort of book, of which he has read but the first page who has seen only his own country.—Stendhal.

PELZER MFG. CO.'S NO. 4 MILL, PELZER, S. C.

—Maxims favor the birth of ideas.—Beaumelle.

—The dread of being afraid renders some aggressive.—Cherbuliez.

—I think I have sound opinions, but who is there that does not think the same—Montaigue.

—S. A. Felton & Son Co., brush manufacturers, Manchester, N. H. and Boston, Mass., are making various changes throughout their factory at Manchester. They have added new machinery, and are increasing the size of their plant.

COTTON DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

American Cotton Spinning Machinery.

ARTICLE XVIII.

CHARLES CLIFTON HEDRICK.

(Copyright.)

To obtain the various movements of the detaching rolls, three cams are employed, those which impart the rotary motion to all the rolls, and which are shown in Figures 108, 109, 110, 111, 112 and 113, and the one which causes F and G to move around E and is shown in Figure 114.

Reference should be made first to Figures 108 and 109 which show respectively the extreme forward and backward positions. On the camshaft W, is keyed a cam B^1, in one side of which is a grove B^2. In this groove runs a roll T^2, which is carried by the detaching roll cam lever S^2, the shaft M^2 acting as a centre around which S^2 is free to turn. Upon this same shaft are fastened a wheel U, having twenty teeth or notches and the internal gear C^2 of 138 teeth. A pawl O^1, which is fastened to a stud K^2, and which is carried by the upper end of the detaching roll cam lever, works in the notches of the notched wheel, and is held in contact with them by a spring F^9, while the internal gear is in contact with a pinion of eighteen teeth, L^2, which is fastened on the end of the detaching roll E.

As the cam revolves, the shape of the groove in it, is such as to cause the pawl to move to and fro. The sides of the notches are square, which permits the pawl to engage with them in either direction. This motion is communicated to the roll E by the notched wheel, the internal gear and the pinion causing it to rotate backward and forward.

By examining the drawings, it will be seen that on the side, opposite from the groove in the cam B^1, is another cam A^2 on the periphery of which runs a roll X, which is fastened to the lower end of the arm Y. The other end of the arm is fastened to the same stud as the pawl O^1. This cam simply acts on the pawl, moving it in and out of contact with the notched wheel at the proper time.

The next four drawings, Figures 110, 111, 112 and 113, show the positions at different stages. All the parts not absolutely essential to explain these movements, are omitted. Figure 110 shows the position of the cams after the detaching rolls have finished turning forward. The cam roll T^2 is on the largest diameter of the cam groove, which is indicated by the letter A. The nose of the cam A^2 has just come into contact with the roll X, which has lifted the pawl O^1 out of the notch in the notched wheel, marked by the numeral II.

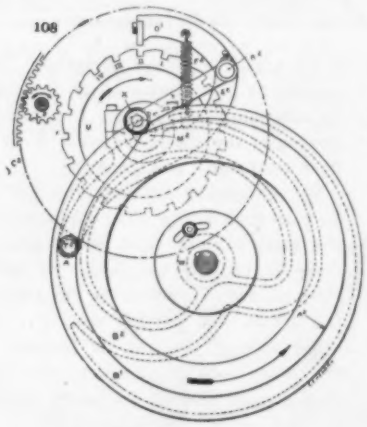
Figure 111 shows the cams as having made about one-half of a revolution. This movement has advanced the cam roll from A to B, and caused the pawl to move from above notch II to notch III, while the gradual decreasing diameter of the cam A^2 has caused the cam roll X to drop and allowed the spring F^6 to draw the pawl into notch III. But it will be noticed that, as yet, no movement of

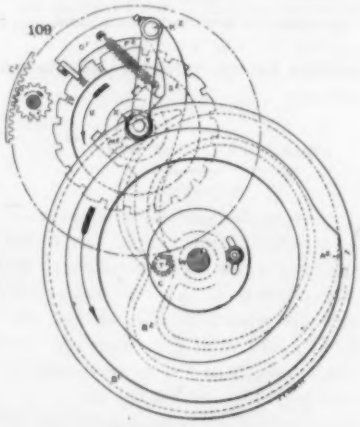
the detaching rolls has taken place.

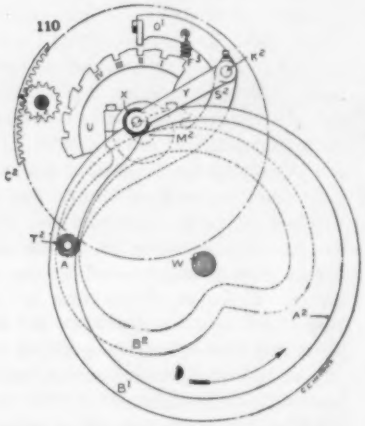
In Figure 112, the cams are shown as having completed about three-quarters of a revolution. The cam roll T^2 is on the smallest diameter of the groove at C. The pawl, which is shown just entering notch III in Figure 111, has engaged the whole depth of it, and the continued revolution of the cams has turned the notched wheel to its extreme backward position, in the direction indicated by the arrow. This movement, through the internal gear C^2 and the pinion L^2, rotates the steel detaching roll E and turns back about one and one-half inches of sliver. The distance moved by the internal gear, is shown by the relative positions of a dark spot marked upon the gear in Figures 110, 111 and 112.

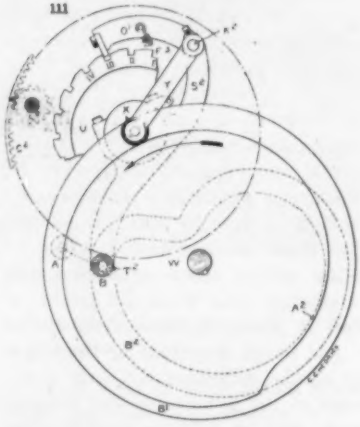
The completion of the revolution of the cams is shown in Figure 113. The cam roll has moved from C back to A and the nose of the cam A^2, has come into contact with the cam roll X. This action lifts the pawl out of notch III, the parts remaining in the same relative positions as in Figure 110, except that the notched wheel has been advanced one notch, and at the next revolution the pawl will drop into notch IV. The point marked by the dark spot, has advanced in the same proportion as the notched wheel, as will be seen by its position above the pinion.

The detaching rolls turn backwards





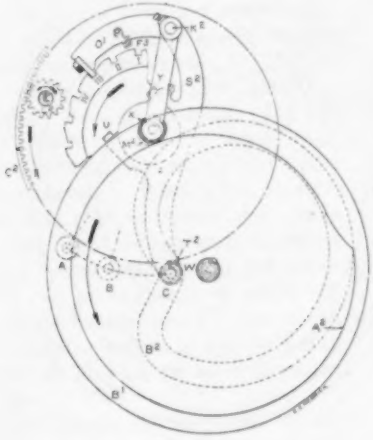




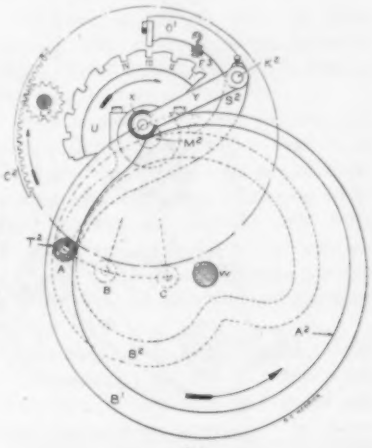
at about 1½ by the timing dial and continue until about 6. The forward movement then commences and continues until about 11.

Figure 114 shows the device for moving the leather covered detaching roll G in and out of contact with the fluted segment of the cylinder.

On the cam shaft W is fastened the lifting cam H^3, with a groove A^3 cut in its face. In this groove runs a roll C^3, which is carried in one end



112



113

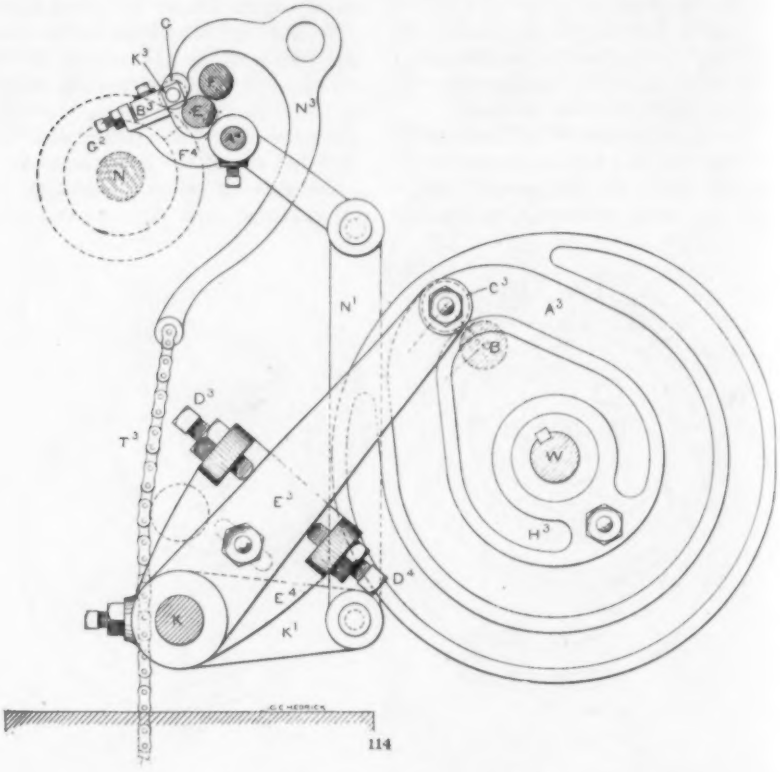
of the lifting cam lever, made in two parts marked E^3 and E^4. The part E^3, which carries the cam roll, is in reality loose on the lifting shaft K, while the part E^4 is keyed to K. The two parts are connected by the adjusting screws D^3 and D^4, which are tapped through lugs on E^4, and bear against the sides of E^3. This permits a very close adjustment to be made when setting the parts. The lifting shaft K extends the whole length of the comb, and upon it are fastened the lifting shaft arms K^1, which are connected to the top lifting lever F^4 by the upright arms N^1.

On the back end of F^4 is a block B^3, which bears against the bushing K^2 on the end of the roll G. These bushings are made square on the outside so as to give a good wearing surface against the blocks. A set screw G^2 in the end of F^4 bears against the block, which allows for adjustment. A weight, not shown in the drawing but connected to the stirrup N^2 by the chain T^3, holds the bushing firmly in place against the block. It also keeps the roll G in contact with the steel roll E and the fluted segment.

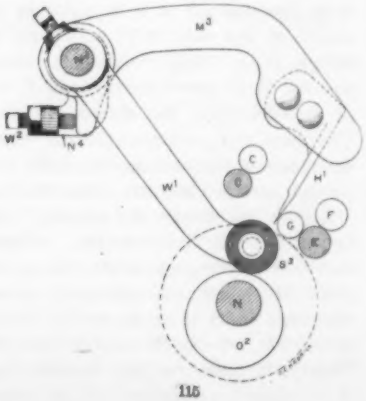
The drawing shows the position of the cam and parts with the roll G in contact with the fluted segment of the cylinder, the outlines of which are shown by dotted lines. As the cam revolves, the groove in its face causes the roll C^3 to move from the position it is in towards the centre of the cam to B, as shown by dotted lines. This movement causes the roll G to move around roll E out of contact with the fluted segment. The cam roll continues in the small diameter of the cam groove until it is moved out at the next revolution.

Figure 115 shows the eccentric for operating the top combs. These combs H^1, are carried by the comb arms M^3 which are centered on the top comb shaft N^3 at one end of which is an arm W^1, which carries a roll S^5. This roll runs on an eccentric O^3

which is fastened on the cylinder shaft *N*. At each of the comb arms bears against the comb arms. The arms are thus free to be turned up



is a dog N^4, which is fastened to the top comb shaft, and through a lug on the dogs is a set screw W^2, which



out of the way for cleaning or repairing the needles. As the eccentric turns with the cylinder shaft, the top comb shaft is turned slightly and the combs are put in and out of contact with the cotton.

—In the February issue of the Textile World appeared an article on ondule effects in woven fabrics, and in which were described various styles of reeds to produce these effects in both warp and filling. A patent has recently been issued in this country for a device for moving the reed as required to produce the desired pattern.

—An Austrian writer estimates the power required for a cotton yarn mill at one horse power for thirty-five spindles.

Room Management from a Speeder Tender's Point of View.

The help should be in their places morning and noon, ready for work at the signal given by the second-hand. The speed should be under full headway, and by this system the confusion and loss resulting from one-third of the help being in the dressing-room, and another third out in the yard, when work should begin, is avoided. Anyone not in their place at the appointed time should be counted late or absent. A repetition of such an offense should not be allowed without sufficient excuse.

The rolls should be oiled as soon as possible Monday morning, and all steel rollers should be oiled every morning. Shell rolls should be oiled at stated periods. Some girls oil their own shell rolls, others do not. You can form your own system. Spindles should be oiled at the first doff, after which the parts should be wiped off. Oil on the boards causes cotton to collect rapidly, which is apt to soil a bobbin which happens to drop on the boards.

Oilers should be instructed to use care in handling the oil. Frequently a large quantity of oil is found on the floor. This is a dead loss. When not occupied, the doffers and spare hands should stay in certain appointed places. This saves a lot of time when they are wanted, as one knows where to look for them, and they will come when called.

All roving should be set in, ½ back at a time, or in a manner as convenient to the doffer as possible, so that she will not be compelled to creel a full back at once. The advantage of this is readily seen. I have yet to find a girl that could set in both ends at once. The work cannot fail to be better when the girl has every bobbin that is running out right where she can see it. This applies to intermediate frames and jacks alike. The work will be much more satisfactory by this system. I have tried every way I could think of, and always adopted the one mentioned, on account of the economy of time and labor, and I think it keeps my work nearer to a standard quality.

All roving waste should be off the floor, and the floor should be swept as clean as possible. Some girls do not wear aprons, and others have no pockets in those that they do wear. Consequently, all the white waste goes on the floor. Trucks should be kept clean and convenient to the operator, and one can use discretion whether the roving should be packed in the truck at doffing, or not.

Bobbins should be kept in their places, and clearers should be kept clean. Here one's own system will be the best to follow.

A card should be given to each girl, with distinct instructions that it is not for ornament, but for use in keeping the clearers clean. Cleaning them four times a day will do very well. It is not economy, but rather extravagance, to run clearer cloths after the nap is worn off, as they will not take up the dirt.

The ends of the roller beams should be wiped at least twice a day, spindles once a day, box and gears not less than twice a week. In some places the girls clean the box gears without instructions, while in other places the rule is that girls should not clean them unless told to do so. By the first method, they look very well, whereas by the second, they are sometimes run without cleaning, until the cotton is burnt solid on the bearings. I have seen rooms where the box gears were cleaned every six weeks, and I have also seen rooms which looked as if they were not cleaned once in six years.

Cutting roving from a bobbin should not be allowed. Under the ½ back system, the roving will run out so that there is no occasion for cutting.

The alleys should be scrubbed at least once a week, and spare floors twice a week. It is no more than right that this should be done, as a girl must sit on the floor to clean the ma-

chine. This systematic scrubbing of the floor is now done in most mills, and a man is always employed to do it. It is best to hire small girls for sweepers, as they will learn to doff while sweeping. A new doffer is of little use for three or four weeks.

When hiring help, they should be given distinctly to understand what is required of them. They should be told that if others can run the card room without single and double ends, they can, and that single and double ends will not be allowed, and that the work must be kept clean. A hand will know then what her work is, and if she does not conform to these rules, she is not what is wanted. Even if she does hanks well, of what value are the hanks when all full of single and double work? And, of what value is a pair of speeders all bunged up?

Perhaps the reader will say that this is too strict, and that it is impossible to carry it out, or it may be said that the overseer has no time for these little details. I am, however, writing this just as I run my own work, and I believe with care good work can be done. Cleanliness makes it hank better. I am always perfectly willing that my work should be inspected at any time, the clearers removed, and also all covers that I can remove myself.

To the overseer, I would say, that I admit it may seem at first hard for you to follow these instructions, but you must have the co-operation of your second-hand. Have it out with him first, and then you will know if he is on your side, or with the help.

I have noticed that an overseer that came into the room with a pleasant word, and yet who would not brook the slightest touch of familiarity, received the most respect. Without respect, an overseer cannot command obedience. He must have the first to command the second. After this system has once been established, the overseer can go through the room with something akin to pride. He will know that the room is running right, not because the help fear him, but because the right way to work has been impressed upon their minds.

In case of a break-down, a girl should notify the second-hand or fixer who should make his appearance as quickly as possible without any comment. If the break-down is due to the fault of the operator, he is, of course, justified in reprimanding her, and carelessness or negligence should be reported to the overseer.

If I have left anything out, I should be glad to have anyone inform me what it is, and I beg the indulgence of the reader if I have gone too far in some details.

A Speeder Tender.

The above was written by a girl who is a skilful and careful speeder tender in a New England mill.

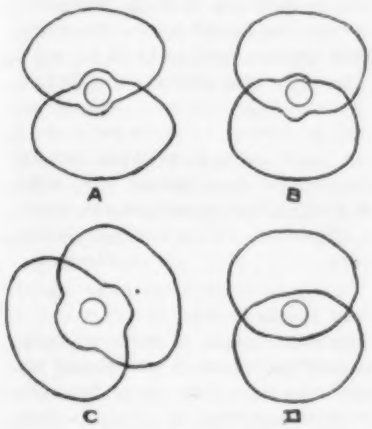
The Relation Between Speed of Loom and Size of Yarn.

The tendency in northern mills toward production of finer numbers, and especially in the making of cloth, has brought into greater prominence the question of the speed of the loom, and the consequent diminution of strain on the yarn. There has always been a leaning toward fast speed looms, and the makers of the looms have done much to foster this idea; owing to the fact that many of them claim for their machinery a production which cannot be obtained except by running the loom at a speed which greatly injures its own lease of life, and at the same time virtually prohibits the weaving of fine yarns; owing to the increase of the work which the weaver is called upon to preform, and which in some cases makes it impossible to run as many looms per weaver as otherwise could be done.

Experience has proved that on the ordinary line of plain work, such as prints, the speed of the loom can be safely placed at 200 picks per minute, and possibly under certain conditions somewhat higher; but for general purposes a loom should not run faster than 200, and we are inclined to the

opinion that many of our mills, and especially the older ones, would be the gainer at the end of the year, if they had their speed nearer 180 than 200; at the former speed the weaver would get a production which would approximate to the maximum, owing to the difference in the work which they would be called upon to do.

Some of our mill managers will persist in running the machines at a speed which every practical weaver knows is detrimental to quality and production. Take, for instance, a loom running on 100s yarn, and which is using 175s filling; to run this loom at a speed of over 150 picks per minute, would mean that very soon half of the looms would be stopped, owing



to the fact that the weaver would be unable to do the work required.

Many times we have seen fine work placed in mills which had been making coarse goods; owing to the inexperience of those in charge, and a desire to show what they can do, the work has been ruined, and only when a return was made to a speed which was suited to the yarn being used, was there any satisfactory progress made.

In the first mill to compete with our English cousins on fine lawns, and a mill which today leads the American industry on fine work, both in relation to cotton and silk, and also on goods requiring both of these materials, the management never try to obtain a large production by speeding their looms, but have the looms running at a moderate rate of speed, and figure the percentage of production higher than would ordinarily be the case; thus the cost of weaving is brought down to a paying basis, and at the same time a better class of goods is produced.

To test this matter thoroughly, and to satisfy ourselves as to the reliability of the latter statement, the working of two looms was carefully observed. One was running at a speed of 160 picks, and the other at 150 picks per minute. Both were running on what is considered medium counts of yarn, and were under the care of the same weaver. After three weeks' running of the looms, it was found that practically the same production had been produced, while the cloth from the "slow" loom was far superior to that taken from the other one.

Another instance which proves the importance of the relation of the speed of the loom to the size of the yarn, is found in the fact that in the mill above mentioned a fabric with 120s warp, was placed in the looms. Owing to the fact that such fine goods had never been woven in this country, the question of the speed of the loom was simply one of conjecture, and the final outcome of the matter was that the speed was found to be "too high," and had to be greatly reduced. The direct result of this reduction of speed was that owing to the increased production the price per cut for weaving was reduced, and the weavers were able to earn more pay at the reduced rate with slow speed than could formerly be done with the high rate and high speed.

With the harness cams as used on American looms the idea seems to have been to produce as long a pause of the harnesses as possible, and to do this involves a quick upward and downward motion, thus causing a

tendency to jerk or strain the yarn, and which on fine numbers must be avoided. The only satisfactory method by which this can be done, is to have the "cams" made with a longer "sweep," and having a very imperceptible pause, thus causing the harness to come to a stop gradually, and of course making slower speed a necessity, so as to prevent the appearance of filling skips in the cloth.

The shape of the old cams are about as shown at A and C, Fig. 1, while the best form of cam for fine work is shown at B and D. Cam A gives a pause of ⅝, came B, ½ pause; cam C, ⅝ pause; cam D, ⅛ pause.

For general range of work the speed of the loom with size of yarn should be as follows: For yarns up to 60s the speed should range from 170 to 180 picks per minute; from 60s to 80s about 165; 100s yarn, 150 picks per minute; 120s yarn 135 picks per minute; while for 140s yarn, with the loom arranged for fine work the speed should not be over 130 picks. I do not consider the American loom well adapted for yarns finer than 140s. Yarns have been spun as high as 400s, and muslin has been woven on special looms in foreign countries with yarns of this size. Experience has proven that an English loom will weave fine yarns at a higher speed than our American looms will, simply because of the peculiar shape of the harness cam, and the absence of any strain on the yarn.

One thing that fixers in "fine" mills should guard against, is having the jack-straps too loose, thus allowing a cam to strike the treadle a blow, instead of the treadle following the cam all the way around. The loom belt should also be kept as tight as possible. If the fine yarns are being woven on dobby looms the speed should be reduced somewhat from the figures previously given, as we cannot get such an easy motion with a dobby, as can be obtained with a cam loom, also because there is more wear on the yarn in shedding. Taking 80s yarn as the standard, I would advise running the dobby loom about 145 picks per minute, reducing the speed for finer yarns. The timing of the harnesses when passing each other should be considered, because on slow speed looms the shape of the cam will not allow of them being timed too

ARTHUR DYSON.

Waste in Combing Cotton.

Editor Textile World:

I wish to add to my contribution to the subject of combing cotton that the amount of waste made in combing cotton depends upon the quality of the cotton and the speed of the cards. If the cards run slow with a production of about 500 to 525 pounds per week of 60 hours, working Egyptian, Peeler or Sea Island cotton, the waste should not run over 14 to 16 per cent. If the sliver was carded twice before it reached the comber, the waste might be reduced to seven per cent. I have run combers with 12 per cent. of waste on the first process, and eight per cent. on the second process, working Egyptian, Peeler and Sea Island cotton.

OVERSEER.

Editor Textile World:

The waste made in combing Egyptian and Sea Island Cotton should not amount to more than seven per cent. On poorer grades of cotton, there would be somewhat more waste. The best way of keeping the waste down, is to pay particular attention to the clearers, keeping the machines in perfect order. I visited a mill some time ago, and noted the condition of the brushes and clearers. The brushes were badly clogged up and doing but little work. The clearer is very important, and should be cleaned every half hour, at least. There are a great many ways to economize as regards waste, such as keeping the rolls, etc., clean. If they become clogged the ends will break down, and cause an unnecessary amount of waste.

DANIEL.

WOOLEN DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Steam or Luster Finish.

To secure the best possible results, the cloth to be steam finished must be made in the loom with this object in view, as the construction of the fabric has much to do with the quality of the felt produced in the fulling, as it is this which contributes to the density of the nap, upon which the excellence of the finish largely depends.

The goods should be made from a fine, good felting quality of wool, and should be laid in the loom of sufficient width to insure a firm and perfect felt.

The amount of fulling depends largely upon the width of the cloth, but allowance should be made for some shrinkage in length. While it is not best to give any definite rule as to the amount of shrinkage in length, we will say that the quality of the felt is largely improved by it, and it may be anywhere from five to fifteen per cent., as may be warranted by the construction of the cloth.

The fulling soap should be of good heavy body, and of sufficient alkaline strength to insure a perfect saponification in its action upon the grease which the goods contain, and should be always applied to the cloth stone cold; and no warmth should be given the cloth by any means other than that which is generated by the process of fulling.

Great care should be taken to avoid over-heating, as a moderate and uniform warmth will produce better results, while preventing the possibility of injury to the fibre which overheating will sometimes occasion.

In applying the traps for shrinking in length, it is much better to adjust them so that they may be working a greater part of the time during which the goods are fulling, than to run them up quickly, and then take them off altogether; the object of this is to allow the fulling in length to proceed in conjunction with the fulling in width, thereby insuring a more perfect knitting together of the fibres as the work advances. After a little study, this can be regulated to a nicety with good results.

Before the fulling two strings should be sewed into the cloth near the end, marking off a yard in length, by the measuring of which the fulling in length may be watched and determined. Should the cloth be 36 yards in length, one inch shrinkage in the space marked off, will represent one yard of shrinkage to the cut. To be more exact in the calculation, the number of inches marked off might correspond with the yardage of the cloth, whether it be more or less than 36 yards.

With a careful regulation of the moisture and temperature, the goods should come from the mills with a very close and firm felt.

Generally, goods intended for steam finish are made "in the gray," to be colored after having gone through the lustring process; the dyeing, as well as the finishing, demands that the cleansing of the goods be thorough and complete, and on account of the compactness of the cloth in its felted state, great care should be exercised, that all the soap, as well as the dirt be removed; any residue in the goods will be sure to result unfavorably in both the steaming and the dyeing.

One of the most important features of the scouring department, upon this class of goods, is a liberal sized tank for warm water, which should be piped to the washer, with a branch pipe for each string of goods. Whether the goods will require one or two soapings, can best be determined by the finisher in charge.

Some finishers apply the warm water first, washing off the fulling soap, before applying any scouring soap. This is rarely a safe method, as the fulling soap, having exhausted its vitality, there is danger that the scouring soap, weakened by the water which the goods contain after such rinsing, may not do thorough work. It is best to first apply the full strength of the scouring soap, adding renewed life to the fulling soap which the goods contain, and allowing them to run twenty or thirty minutes; then rinse off with the warm water, and if necessary, give a second soaping, which will have little of the original dirt of the goods to contend with, and insure a thorough cleansing.

No cold water should be used in the first rinsing, nor in the last, until all trace of the soap has disappeared by the use of the warm water which should always be used at a uniform temperature, not exceeding 110 degrees.

After scouring, the cloth should be slightly extracted, when they will be ready for gigging.

Regarding this part of the work, it will be impossible to give any instructions in detail, as it very largely depends upon the weight and quality of the goods.

The work should begin with dull, or old worn teasles, and the cloth given six or eight runs, when the slats should be turned, and a like number of runs given; this should be repeated with a better grade of teasles, and then again with still a better grade, changing about half the slats each time, removing the poorest.

With each change of slats, the cylinder or cloth should be reversed, so as to gig in opposite directions alternately, planning to finish in the direction the nap should lay when finished. If a double cylinder gig is used, the two cylinders may be run in opposite directions, thus turning the nap with each run, and finishing the work with the last set of slats, or last side, by running both cylinders in the same direction.

On very heavy felted goods, it is sometimes customary to run the cloth on a cropping shear when the gigging is partly done, cutting off a part of the nap, so that when the gigging is resumed the teasles can better work up a thick nap, without the resistance which the full length of the nap occasioned. Care should be taken not to cut too close in cropping, the idea being to remove enough to give an even length and "level top" to the nap, and give a chance for the teasles to work up a good thick bottom, as the density of the nap produced, determines in a large measure, the excellence of the finish.

Should the modern napping machine be used in the place of the gig, the work will need to be governed by the best judgment of the finisher. In fact, as already intimated, it is impossible to lay down any exact rules for this part of the work. The directions given will serve as a general outline of procedure; but, it will require skill and attention to determine more minutely the detail of the work, and to produce the best possible density of nap, and retain the strength and perfection of the fabric. A good moisture should be maintained during the gigging process, otherwise many of the fibres that should compose a part of the nap will be drawn out and wasted.

We now come to the lustring process, the methods of which have undergone decided changes during the past twenty years, the improvements being largely in the nature of time saving rather than in the excellence of results. The old methods consisted of running the cloth on an up and down gig thoroughly saturated with water in a trough in which the bottom roll

was set; afterwards the cloth was wound on a wooden roll, covered with a cotton wrapper and placed in a tank of water, at a temperature of about 200° F., remaining from three to five hours, after which the goods were allowed to drain and cool for 24 hours or more, when they were again put on the wet gig and rewound, so that the end that was outside in the first boiling, would be next to the roll, and the boiling process repeated, thereby giving the whole piece a uniform treatment.

After the second boiling, the rolls were allowed to cool, after which the cloth would be ready for dyeing or dry finishing, as the case might be. In the boiling, the best results were obtainable by having the tank arranged so that the rolls would not touch each other, and in draining and cooling the rolls stood on end, and were changed occasionally so that the draining would be partly from both ends of the roll, thereby keeping the sides of the cloth as nearly as possible uniformly saturated.

This boiling method of lustring is somewhat in vogue at the present time, but there has been a variety of methods of steaming to improve upon it, the latest and most approved of which is the brushing and steaming, or lustring machine, which permits of doing in a few hours' work that formerly required several days by the old slow method of boiling and necessary cooling.

This modern machine is constructed with a perforated copper cylinder on each side, with pipe connections for both steam and cold water. In the centre of the machine, between the two cylinders, there is a cylinder brush.

After gigging, instead of using the wet gig, the goods are run several times from one cylinder to the other over the brush, thoroughly saturated by the water supply provided; then they are wound tightly on one of the cylinders, with the leader of heavy cotton cloth thoroughly wrapped around the roll, and the steam is turned into the cylinder, which takes the place of the old boiling method. The cloth is then cooled by shutting off the steam, and substituting cold water. After this, the cloth is transferred to the other cylinder and the process repeated, whereby the effect of the steaming is equalized in the cloth; thus, in a very few minutes, the work on one piece is completed, with a great saving of time over the old method.

The length of time for the steam to remain on the cloth is a point that the finisher can decide best; the work should be uniform so that the pieces may be treated as nearly the same as possible.

Following this process, the goods are carefully folded and ready for the dyeing. Following the dyeing, the cloth should receive a thorough wet brushing in order to lay the nap, which will have become somewhat disarranged by handling in the dyeing.

Following this, comes the drying and other processes of dry finishing. The shearing should not be hurried, and the length of nap to be left on the cloth must be determined by the good judgment of the finisher. Undoubtedly, the best pressing for this class of goods is such as is given in the old way of papering and pressing with hot plates. If the heat is properly regulated, there is nothing better than the hollow plate press, by which the steam is let into the plates, followed by cold water for cooling.

Most mills are fitted up with the modern rotary press, hich are valuable for their labor saving advantages, but they give to the cloth a glazed effect which sometimes requires special steaming to remove. When the rotary press is used, the cloth should be run on a roll, and well covered with a thickness of Manila paper, and allowed to remain until cool. Whatever method of pressing is practiced, the goods should not be handled while warm from the press.

When thoroughly cool, they should be run over the steam brush, and sufficient steam applied to remove the press gloss from the face. Care should be exercised not to allow the steam to force through the cloth to destroy the pressure obtained. This steaming should be done with the steam adjusted so that one run will suffice, not allowing the cloth to stop during the operation.

This being done, the cloth is ready for inspecting, measuring and putting up for shipment. Some detail of the work which is common to all kinds of goods, such as burling, specking, etc., we have not mentioned, dealing only with such parts of the work as require special treatment or extra care on account of the finish under consideration. ELMO.

—The British preferential tariff in Canada is not relished by Canadian woolen manufacturers. It is estimated that for the past year the value of woolen goods imported from Great Britain into Canada will reach fully $10,000,000, as compared with $6,203,844 for 1898. The Canadian manufacturer has not even the poor satisfaction of believing that his loss is the beloved mother country's gain, for the Canadian Journal of Fabrics claims that French and German goods are sent to England, where slight finishing touches are given to them, and then they are sent to Canada, where they are received under the preferential tariff as English goods. In addition to this Germany has discriminated against Canadian goods because of this British preferential tariff.

—To find the weight in pounds of a grindstone, multiply the square of the diameter in inches by the decimal .064, and this product by the thickness in inches.

—Common sense is the doorkeeper of the mind. Its duty is to prevent the entrance or exit of suspicious thoughts.

Improved Shoddy Picker.

A German has constructed a yarn and rag picker which he claims is much superior to any machines heretofore used for this purpose. The Ost. Wollen und Leinen Industrie gives a description of the machine in which the writer states that the stock picked on this machine has a much better staple than is found in material picked by the machines heretofore in use.

The machine is built with the teeth set in different degrees of fineness to suit the different kinds of stock to be treated. Thus for matted fleeces, knit goods, threads, etc., the teeth are not set so close as for old rags, thibets, flannels, cotton and vicunas.

This new picker differs from the ordinary machine principally by its having two or more sets of feed-rolls. This permits of a much thinner layer of stock at each set than can be employed on the old picker, without a corresponding loss of production, while the staple is not broken as much.

In addition to the saving of the staple, this machine turns out a much larger production than is possible by the ordinary rag picker, as the former is 39 inches wide as compared with a width of 12 or 16 inches in the latter.

Another feature is the peculiar shape of the casing which permits of the feed rolls being set much closer to the cylinder, accompanied by a much better combing of the stock by the teeth of the cylinder. The cylinder runs much slower than the ordinary picker cylinder, being 450 revolutions per minute for the former, compared with 750 for the latter.

By a suitable carrier the stock which has passed through the machine, and failed to be sufficiently picked, is brought back to the upper feed rolls to be again subjected to the process. The finished material passes underneath, and can be blown into a room or carried direct to the baling machine.

It is claimed the machine does not require over 2½ horse power. The space occupied is about 10 feet in length, 7½ feet in width, and 8 feet in height. The machine weighs about 4800 lbs., and the production in 10 hours varies from 1800 lbs. to 2220 lbs. of picked stock.

Owing to the saving of the staple the stock is more valuable, and one of the leading manufacturers of Germany, estimates this increased value at from 2 to 3 cents per pound, and the Austrian journal states that dealers, consumers and even shoddy manufacturers recognize that old methods cannot compete with this new machine. The writer adds that not only the rights to the machine, but also the stock itself has been protected by the patents. A company has been organized for the introduction of the machine in Germany.

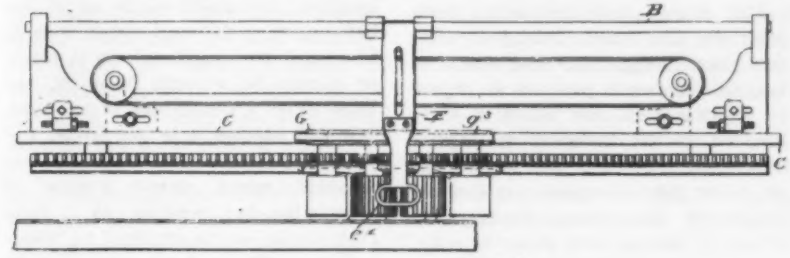
—Poor generals have been known to win battles, but there is no record of a fine painting from the brush of a poor artist.

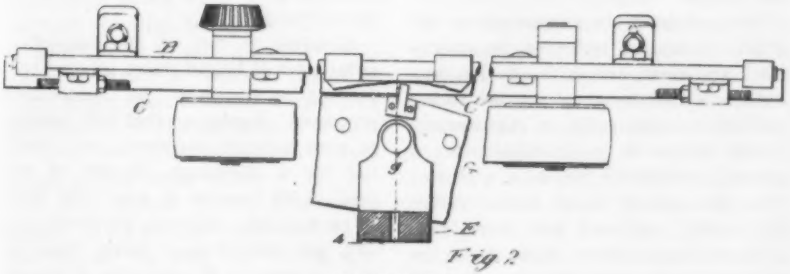
Second Breaker and Finisher Card Feed.

A modification of the ordinary second breaker and finisher card feed has been recently patented, and is shown in the illustrations. Fig. 1 is a front elevation, and Fig. 2 a plan of the device.

The apparatus prevents any strain upon the sliver when laid upon the feed-aprons, and thereby causes the slivers delivered by the first breaker or carding-machine to the second breaker and from the second breaker to the finisher to be more uniform in size and weight, and causes the "ends" delivered from the finisher to be of uniform weight and size from side to side of the finisher, except the side ends or waste ends, which may be lighter than heretofore and therefore require less recarding.

The strain upon the sliver between the feed-rolls and the apron is prevented by giving to the feed-rolls a surface speed greater than the travel of the carrier, so that the feed-rolls deliver a greater length of sliver than





CARD FEED.

the distance traversed by the carriage. This prevents the doubled ends of the sliver from being drawn away from the sides of the feed-aprons or feeding-surface toward the centre of said feeding-surface.

If the tension of the sliver is too great between the delivery-rolls and the machine next preceding in operation the relative speed of said machine must be increased or the speed of said feed-rolls must be diminished.

The slivers have heretofore been positively fed to the carding-machine; but the attempt has been made to keep the slivers in place on the apron by holding them only where they are doubled at the sides of the apron, whereas I hold each course in place as it is fed throughout the whole length of the course, binding the sliver as fast as said sliver is delivered by delivering said sliver under the presser-bar and between said bar and apron.

The carrier E is supported on the guide-rod B and is driven diagonally back and forth across the feed-aprons by the belt in the usual manner to lay the slivers diagonally on said aprons.

The carrier E is provided with a plate G, pivoted thereto at g, a part of the rear edge of which bears against the rail C, and said rear edge is so inclined from back to front from the middle to the ends thereof at g^1 g^2 that either of said inclines may be brought in contact with said rail by turning said plate G on its pivot.

The plate G is held in either of these positions, as by a spring, represented as a leaf-spring g^3, clamped between the front of the carrier E and the sliver-guide e^1, which is of ordinary construction and is secured by bolts e^2 to said carrier, Fig. 1.

The spring g^3 is curved, and it ends are adapted to hook backward over the sides of said plate G and prevent the same from being accidentally turned on its pivot, while at same time allowing the plate to be turned by the application of sufficient force.

The Preparation of Wool for Worsted Yarn.

I will describe one of the most successful methods of preparing wool for the cards, by some of the best mills, engaged in the manufacture of worsted yarns in this country. We will take as our example a lot of ⅜ stock, intended for medium grade worsted cloth.

This grade, in mills that use various qualities, is usually made up of the better part of the wool sorted from ¼ blood, and the rejections from ½ blood, or it may be straight ⅜ stock, but more likely a percentage of all three. We will assume it is the latter, and that the boss sorter has kept the lots separate, which should always be done whenever possible, as a more even result can be obtained by blending the different lots together in proper proportions than by throwing everything that will go to ⅜, into one pile or heap.

Blending is one of the important points, for if begun right, greater uniformity will result in subsequent processes. Assuming that 5000 pounds of card-balls are required, and allowing for a shrinkage of say 45 per cent., 9,100 pounds of wool will have to be scoured. Suppose we are to use 33⅓ per cent. of wool sorted from ¼, 33⅓ of straight ⅜, and 33⅓ of the rejections from ½ blood. Weigh 100 pounds of the first lot, and lay it out on the floor, then 100 pounds of the second lot, spread out on the top of the first, followed by 100 pounds of the third lot, repeating the process until we have the required quantity.

The next process will be, to run the wool through a good duster, taking the wool from the pile vertically.

The advantages of dusting the wool before scouring are: 1st it frees the wool from a very considerable percentage of foreign material, such as dirt, burrs and vegetable matter; this in itself, will effect such an economy of soap in the wash-bowl, as to amply

pay for the dusting operation. 2nd the wool is blown out of the duster, in light fluffy state, well opened up, and blended together in good condition for washing, which can be performed better and quicker than when the dusting is omitted; the dusting machine must be a good one, and cleaned every day.

We will now take into consideration the scouring of the wool; there is probably no department in the average worsted mill that receives less attention, than does the wool washing, and this to the writer is a matter of surprise, as many a bad spin can be traced to inefficiency and poor judgment in the wool-washing room.

In the first place the bowls should be of large capacity; 4 bowls are better than three. The wool can be washed better when the bowls have a large capacity, for the fibres have a better chance to open out and separate from each other; then there are less changes of water, for it does not dirty so quickly; or to put it another way, more wool can be washed; better in large bowls than in small ones, owing not so much to the increase, of weight of wool fed in, as to the more rapid action of the water itself.

In the second place great care should be taken not to have the water too hot, or the soap too strong, and this is a point that calls for the best judgment of the scourer, as no exact rules can be laid down for his guidance. It is well to remember, however, that wool which has been subjected to a hot and strong alkali bath is burnt and made tender; this impairs the spinning qualities and ultimate strength of the yarn; no amount of oiling can fully restore it to its former state of elasticity.

Care should also be taken to use only good soap, free from soda and other injurious adulterants that may have a tendency to make the fibre "brittle," or a bad color; as the natural grease in wool is composed largely of potash, it is always safe to use a potash soap. Ammonia may be used to advantage in many cases in addition to the soap.

Drying may be divided into two classes, one by artificial heat and the other by forcing cool air through the wool. By the first method the greatest danger lies in applying too much heat, which is apt to make the wool crinkly and frowsy, besides causing it to shrink.

As regards the second method, when the wool is on the back of the sheep, it is washed frequently by the rain, and dried in the open air, without damaging the fleece in the slightest; it is therefore reasonable to suppose that the nearer one keeps to natural methods, the better will be the result, and although the second method may be the slower, it is probably the safer and better. FALCON.

—It is reported that at the request of the men's wear clothing trade of Cincinnati, the American Woolen Co. have appointed an adjuster to settle claims made by the customers of this concern for imperfections in the goods. The rule heretofore has been to have all goods in dispute returned to the manufacturer. The trade found this inconvenient, particularly in the busy season when the goods were wanted by the cutters. This action of the clothing trade is an encouraging sign, as indicating that the combine is making progress in the reform of trade abuses. Small mills have in the past been forced to accede to unjust claims made by customers at distant points. They could not adopt the rule of ordering such goods returned, for generally the trade of one mill was not large enough to absorb the rejected goods. With a concern selling thirty or forty million dollars' worth of woolens per year, this rule can be enforced, and has been followed, if we may credit the report referred to, with excellent results.

—Woolen manufacturing is in bad shape in Canada. Mills are shutting down, or running slack.

Effect of Air Moistening on Finishing Woolens.

Editor Textile World:

Having recently come over from England, where I worked in one of the best of the west of England mills, noted for the handle of its goods, I have been impressed with the harsh "feel" of the goods made in this country.

Some of the goods made here are very harsh, owing to having been scoured with too much alkali and too little soap; but leaving these influences out of the question, and taking the productions of the finest mills, the goods here are harsher than they would be if made in England from the same stock.

The best manufacturers in England recognize that woolens are better if made slowly, and some of the best woolens are never less than a month in the finishing process, often three months, if made for stock.

Even worsteds are often a month about the finishing mill, and are better for it.

I have been told by London jobbers that they have noticed that a piece that has been twelve months on their shelves will feel better than a new piece. In this country a piece of imported woolen cloth, especially cheviot, kept in a tailor's store for 12 months becomes nearly as harsh as a domestic of the same grade.

I thought, at first, that this could be remedied by taking more time, and giving more brushing, and at the first opportunity tried the effect of more brushing, but soon came to the conclusion that to brush dry goods did not improve them; rather the reverse. I then started spraying them before brushing, but the dry, hot air of the finishing room, combined with the friction of the brush, seemed to dry them at once. I found that electricity would be produced, sparks would be felt, and in some cases seen, when running over the brush or shear.

In England, this is almost unknown. If we get a prolonged spell of east wind (the dry wind in England), this result is produced in a lesser degree, but in the mill I was in, we considered that the goods were all going wrong when that was the case; not to the extent of being unmerchantable, but they did not handle the same.

I have come to the conclusion that to take more time in this country is worse than useless, as it only increases the dryness of the stuff. In England, we generally overdry the stuff in the tentering machine, as is the case here, but there a piece will regain its normal condition of dampness in a day or two by absorbing moisture from the atmosphere, and the effect of brushing them is to give a soft and silky handle and a delicate lustre to the thread, quite different to the glaze of pressing.

In the little details of perfection, mending, picking and shading, particularly mending, we cannot afford to be as particular here as in an English mill, as our wages in those departments are much higher, but in general finish and handle, I see no reason why we should not do as well here if the air in the mills is kept at a suitable humidity.

I have had but a comparatively short experience here, and may later see reason to modify my views on this matter, but I think, as a rule, that after a short time here, an Englishman gets so used to the harsh touch, that he ceases to notice it and strives after a better result.

MERRIE ENGLAND.

Air moistening in our woolen and worsted mills does not receive the attention which it deserves. The advantage of humidification in these mills will prove to be an improvement in the working of the stock in the carding, spinning, weaving and finishing processes, as well as an improvement in the "feel." We called attention to this subject on page 417, September, 1900, Textile World. We shall be pleased to hear from the Englishman again when he has had more experience with the "harsh touch" of Yankee fabrics.

KNITTING DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

The Knit Goods Situation.

The knit goods market in some of its branches has been in a peculiarly unsettled and unsatisfactory condition during the last few weeks, but a healthier tone prevails at the present writing than has been apparent for some time. A mild fall and winter has left an unusually large stock of heavy underwear on the hands of the jobber and retailer throughout the country. One Western jobber is reported to have carried over as many as 1000 cases of men's and children's fleeces.

As a consequence of this surplus, orders for fall goods have been far from satisfactory from the manufacturers' and commission man's standpoint with the result that all kinds of price reductions have been made until it seems as though the bottom must surely have been reached at last. Notwithstanding the fact that the price of cotton is very materially higher than last season's prices, goods have been offered considerably lower than for fall of 1900.

Standard weight fleeces which were offered at the opening of the season at $3.62½ and $3.75 are now being quoted at $3.50, and even at that price buyers are by no means eager. Many prominent underwear jobbers have expressed it as their opinion that the popularity of the fleeced lined garments is on the wane, and that there is a decided tendency toward the revival of the flat goods and ribbed goods of past years.

Certain it is that the manufacturer would welcome such a change with delight, for it is on these heavy fleeces that nine-tenths of the underwear business of the country has been done during the past few seasons, and there is no article in the underwear trade on which the competition is so keen and the margin of profit so small, both for the manufacturer and the jobber.

The past few days of cold weather has given the retailer an opportunity to work off some of his winter stock, but it has come too late in the season to have any noticeable effect in jobbing circles. On spring goods, deliveries have been somewhat slow, as a rule and re-orders are coming in in small volume.

Many rumors are afloat with reference to a projected combination of fleeced and flat-goods manufacturers and it is quite possible that such a combination may be effected before the opening of next season's business but the movement is still in its infancy and many obstacles have to be overcome before its success will be assured. It would seem as though such a combination, if organized on a legitimate and sound financial basis, might tend strongly towards lifting the underwear manufacturing business out of the demoralized state into which it has fallen during the last few seasons.

The hosiery market while not experiencing any boom is in decidedly better shape than the underwear market. Manufacturers of domestic cotton hosiery report fairly satisfactory business for fall with prices about the same as last season. Staple lines of woolen hose are being offered

at prices about 5 per cent. lower than those of last season.

Business on spring goods has been extremely satisfactory. Ladies' black cotton hose in dropstitched and open work lace effects, have sold well both in seamless and full fashioned goods, and within the last few days manufacturers report a decided demand for this class of goods in colors more particularly reds and purples. Lace effects and embroidered goods have also been popular in men's half-hose and in the lower grade goods printed and extracted designs are still in popular demand.

The foreign hosiery market still holds firm with the exception of some staple lines such as "single 19's," which may be bought for about 15 pfennigs less than a few weeks ago. There are large stocks of staple goods on the Chemnitz market, and this reduction in price would in all probability have been more marked were it not for the fact that the German manufacturers have been utilizing these stocks of plain goods for the purpose of converting into fancies in the shape of extracted and embroidered goods.

The demand for low priced fancies to retail at 25 cents is very strong, and the New York market has been entirely cleaned up on this class of merchandise. Importers claim that they are simply unable to get deliveries on their fancy goods.

In the higher priced goods at $4.50 and upwards, embroidered fronts will be very popular. Combination embroidered and openwork effects are also thought very well of and will, undoubtedly, be in popular demand this season. Red will be a prevailing color and seems to come in for even a larger share of popularity than the pastel shades of last season, which, however, are still considered very good and are being extensively shown in the finer goods.

In fancy knit goods, importers have already done an extremely satisfactory business, and many attractive styles are being shown. One of the lines of goods which have, perhaps, attracted more attention than any other, are the ladies' golf vests, which have been much improved upon since last season and are being shown in a vast variety of styles, coloring and combinations of colors.

This garment may be had either with or without sleeves, and one of the newest models shown by a Broadway importer is made high at the neck with fashioned neck band to which a white linen collar is attached, making a very natty and effective costume for the lover of out-of-door sports.

As an indication of the cotton yarn market, we might draw attention to the action of the Southern Cotton Spinners' Association which met in Charlotte, N. C., on Saturday, Feb. 16th, and after three hours' conference passed the following resolution:

"Resolved, That we recommend that all mills stop night work entirely for four months beginning March 1st, 1901, and that the mills running daytime only stop one day in each week beginning March 1st. At the expiration of sixty days from March 1st, mills stopping night work shall also conform to arrangements made herein for mills running in daytime only."

As a result of this action, it is calculated that the production of the cotton yarn mills will be reduced by about thirty-three and one-third per cent. Every yarn mill in the South will be communicated with, and already the owners or managers of plants representing nearly 500,000 spindles have signified their willingness to act in accord with the recommendation of the convention. It is earnestly to be hoped that the general adoption by the spinners of the curtailment system recommended by the convention, will result in the restoring of the cotton yarn industry to a more satisfactory and profitable basis than it has been on for some time.

Sewing and Finishing Machines in Underwear Mills.

PREPARATORY MACHINES USED IN THE FINISHING ROOM.

No. VII.

(Continued from February.)

The machines required for preparing the knitted cloth and the trimmings for the finishers have nearly all been specially designed for the knit goods manufacturers, except the power or electric cloth cutting machines and the machines for cutting the large pieces of domets, silesias, etc., into strips or ribbons.

The old way of cutting or shaping the sections of shirts and drawers, with a large knife following a slot in the cutting table, is fast giving way to the power circular-knife cutting machine, because it is more economical, saving labor, time and material. The cloth is laid in layers on the table, as of old, patterns put on and marked out on the cloth, then the operator takes the cutter in hand and cuts out the sections as marked, close to the line, rapidly, accurately, and with a minimum of waste.

The circular cutter is run by electricity, or by means of a flexible shaft, can be easily operated on any part of the table, has an automatic sharpening device, and, with the flexible shaft arrangement at least, is always ready for work and not liable to get out of order; with it, cutting is done quicker, much easier, with less waste, and the sections when joined together make a far more shapely garment than when cut in the old way by the knife and shear system.

Machines are fitted up to run by power where electricity is not desirable, and, in fact, they are better and safer for a knitting mill, perhaps. These power machines will cut three inches in depth of fabric, are operated by men or women, who average 275 dozen per day, and will save their first cost in three months. They have been in use in overall, pant and shirt factories for ten years, and in some knitting mills that length of time, with success.*

The "Gem" cutter has been a popular machine for cutting the rolls of pieces of cloth into strips of desired widths. It is not the most modern type of machine, inasmuch as it is operated by a hand lever. This old-fashioned system of leverage calls for a long lever and considerable force applied. It does not always cut accurately, that is, every strip just the exact width, but nevertheless it is, or has been, universally used because it fills the bill much better than any machine that could be procured for the purpose.

Now, however, there is on the market a machine adapted for just this purpose. Like the "Gem," it was designed and built for a paper cutting machine, but it is far better adapted for the use of knit goods manufacturers than is the "Gem." In place of a long lever, it has a hand wheel, so connected by gears and links to the cutting bar that the operation is comparatively easy for the operator. Because of this hand wheel, it occupies much less room than a machine with a long lever, and because of the gearing it requires much less strength exerted.

It has a mechanical device for changing the speed and power. By shifting gears the speed can be increased and the power decreased for light work, or the speed decreased and the power increased for heavy work. It has a double clamp screw which ensures equal pressure on the

*More recently a system has been devised whereby pattern boards are made with the proper shaped slots cut in them. In these slots a shoe, with guide rolls projecting from the lower or bottom side, follows the predetermined pattern (as per the slots or guide channels) and, the layers of cloth having been properly laid as per given directions, the circular cutter or machine is slid into the shoe and as the operator pushes the cutter along, the sections of the garment are cut out in accordance with the laid out lines on the pattern boards, doing away with the marking with patterns on the cloth with pencil or chalk. These pattern boards are an inch or less thick, and are readily laid on the cutting table or removed when distinctly different patterns are required. By an ingenious and simple arrangement all ordinary sizes can be cut with one pattern board.

work, and clamp always parallel with the table. The stroke of the knife is determined by a crank motion, making an exact and smooth cut. It has a simple and reliable adjustment of knife, runs easy and noiselessly, and can be run by hand or power. A machine for hand power only can be furnished if desired. It is the Brown & Carver cutting machine, and is built by the Oswego Machine Works, in a most excellent manner.

The old method of cutting and folding button stays, facings and drawer bands by hand was done away with by the invention of the Automatic Band Folding and Cutting Machine, first introduced about fifteen years ago. By the original method the cloth was first cut into strips with the shears, then cut into the different lengths and folded by hand. Cloths, such as Domets or flannels, have to be ironed in order to retain the folds. The method now in vogue is to take a whole roll of cloth, and by folding it in a certain way, cut off a long strip or ribbon the entire length of the piece. This is done on a cutter like those referred to above, with a knife about thirty inches long. The strips or ribbons are then fed into the band folding and cutting machine where they are turned, folded, creased down flat into stays, facings, etc., and then cut into the exact lengths desired.

The operator simply starts a ribbon or strip, after which the several operations are continuous and automatic, coming out a finished stay or facing, ready for the finisher. The cutting arrangement is adjustable, and can, in a few seconds, be made to cut any desired length from five to forty-five inches. Attached to this machine is a heating arrangement, used for folding worsted or woolen trimmings. It can be heated either by gas, steam or lamp, as desired. The machine is simple, very easily operated, does a large amount of work, has been used by knit goods manufacturers for the last fifteen years, is well built, and marketed by Thomas Kennedy, Cohoes, N. Y.

Another cutting machine is the Irregular Form Cutting Machine, built by the same party, which cuts any irregular shape, as drawer bands, forms, gussets, pockets, etc., with positive accuracy. It was especially designed for knit goods manufacturers, and does away with the annoyance and loss caused by the waste and labor cost, which obtains when a block with a die and mallet is used to cut irregular shapes, besides dispensing with a lot of hard labor.

The old method of marking the necks on a garment, preparatory to cutting out, is by means of a wooden pattern properly shaped. The garment is laid on the table, and the centre of the neck found by folding the garment in the middle until the shoulders are even, then marking the crease at the fold. The centre of the wooden pattern is then placed in the middle of the garment, as per the marks, and the outline traced with a pencil, which leaves an ugly black mark that frequently shows on the completed garment, much to the disgust of the seller and the buyer. These marks are entirely unnecessary now, inasmuch as there are on the market at least two machines that do the work more rapidly and accurately, besides doing away with ugly black pencil marks.

The Automatic Neck Marking Machine, built by Thomas Kennedy, is very simple, and the operation still simpler. It has been on the market for the last ten years, and is operated as follows: The garment is taken hold of at the shoulder points by the operator and placed against the adjustable gauges on the machine; touching the treadle with the foot causes the marker to descend and make a crease or crimp in the cloth, a rapid, easy and clean manner of marking the necks, and far more economical than the old way by hand. The forms for different shapes and

sizes of necks can be changed in an instant.

The New Champion power neck marker has recently been put on the market by E. M. Antisdel, Utica, N. Y., and is spoken of very favorably by those using it. A description and cut in the Knitting Department of the January number of the Textile World shows it up fully.

Power rib cutters are another labor saving machine, doing the work of four or more girls cutting with shears, and do it more accurately. When cutting by hand, every slip of the shears spoils a rib and makes waste. The McCreary rib cutter has been on the market a long while, and is very popular. It is a very simple machine, hardly anything to get out of order, is easy to operate, rapid and accurate. Kennedy's rib cutting machine is a well built machine, quick and positive, will cut from four to five times as many ribs as can be cut by hand, and will do it without waste. MET.

The Murphy Elastic Stitch Seam Trimmer and Finishing Machines.

These machines, which were introduced to the knit goods trade some years ago, by the Kruse & Murphy Mfg. Co., of New York, now make their appearance in a greatly improved and modified form. While the general features that were found so desirable in the earlier types are still retained, many improvements have been added and the various movements accomplished by a more durable and direct arrangement of the parts.

All wearing parts, such as studs, bars, shafts, etc., are carefully made as to workmanship from the best material, hardened and ground to gauge. The different parts that enter into the construction are made in duplicate, and the manufacturers constantly keep on hand a stock of each, thus insuring a prompt delivery to the users, should it be found necessary at any time to replace anything broken or worn.

One of the uses to which the trimming machine is particularly adapted and on which at the present time it is giving great satisfaction, because of the elasticity of the stitch, is for welting or making the concealed stitch on hosiery. All manufacturers of knit goods who desire to keep their products in the front rank as to quantity and quality, will do well to investigate further by consulting with the makers or their agents.

Mr. W. C. VonBuchwald, of 120 North 7th Street, Philadelphia, Pa., would be pleased to hear from all manufacturers located in Pennsylvania who desire information or prices about this or any other machine or parts for same made by the K. & M. Mfg. Co., and he will place his experience at their disposal to assist them in filling their needs in the sewing machine line.

Removing Seeds from Cotton Knit Goods.

Editor Textile World:

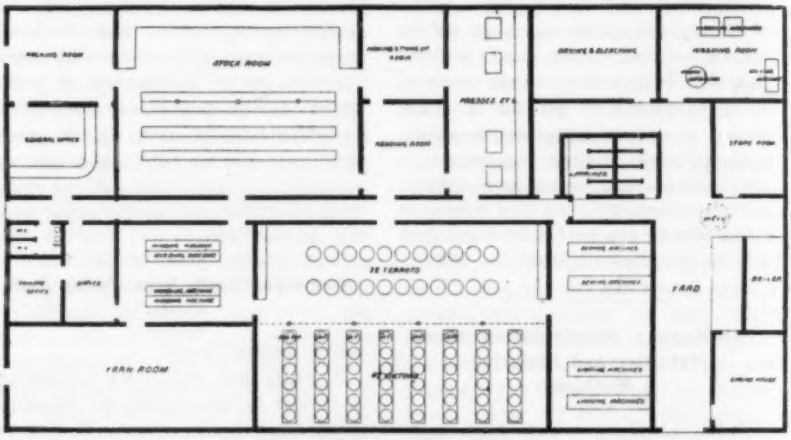
Recently you published a question in regard to the method of removing seeds from cotton cloth. It can be done on knit goods when the yarn is being wound. The device for this purpose consists of a board, the top of which is half round shape. This board is covered with strips of card clothing, No. 35 brusher wire. As the yarn passes from the cops to the knitting bobbins, it first goes through tension guides, and then is drawn over the half round board and through the card clothing. It is surprising what a large quantity of slugs, seeds, etc., are taken out of the yarn by this process. One would hardly believe that so great a difference could be made by such a simple device. I have found it to make a difference of at least 50 per cent. in seeds, and to increase the production of the knitting one-quarter, provided the winders are careful in tying knots.

BOKHARA.

Hosiery Mill.

The illustration shows a plan of a hosiery mill prepared by H. J. Haigh, an English architect, from two plans which took the first and second prizes in a competition recently held in that country.

The Hosiery Trade Journal states that the competition was for a plan to provide for one boiler, one 20 h. p. engine, six "Race" rib top machines, thirty-eight fully automatic "George" knitting machines, twenty-two "Terrot" circular machines, 17 in. diameter,



PLAN FOR HOSIERY MILL.

12 linking machines, nine sewing and trimming machines, and also the necessary plant for the scouring, finishing, etc., of the above production. The drawing to show all necessary office accommodation, stock, winding, and other rooms, together with any other details necessary.

This modified plan, shows all necessary rooms, etc., for a small business plant as specified. The yarn is delivered direct to yarn room, adjoining which is the winding room, with direct communication to knitting room, which shows the arrangement of the machines; adjoining this is the sewing and linking machines.

The finishing department has, as shown, no connection with the factory or warehouse, as owing to the presence of heat and steam this is necessary.

After being washed and dried, the fabrics or goods are taken direct to menders and make-up room, and then to stock-room, where they are packed and sent away from packing-room, having never passed over the same ground unnecessarily.

The offices are arranged with direct communication with all parts, the main centre passage not only separating the two departments, but acting as a special advantage in this direction, while the special side entrance and yard enables all coal and other freight to be delivered without hindrance to delivery of raw material or sending away of finished goods.

Circular Knitting Machine for Fancy Effects.

This machine recently patented in this country, has attachments by which the goods are printed to produce fancy designs.

The specifications state that the invention consists in employing in circular-knitting machines, at a suitable point below where the fabric has been knitted, one or more printing rollers, wheels, or blocks, adapted to run against fabric as it has been knitted and print designs in one or more colors in a continuous or intermittent

manner, as may be found most suitable.

The said rollers, wheels, or blocks may be applied at the upper end of the needle-cylinder and mounted in suitable troughs charged with color. These rolls are revolved by the fabric through frictional contact or can be driven by suitable gearing, so as to print longitudinally, or the blocks suitably supplied with color, may be reciprocated to and from the fabric by levers and cams, and be adapted to print thereon longitudinally, crosswise, or diagonally.

The troughs containing the rollers,

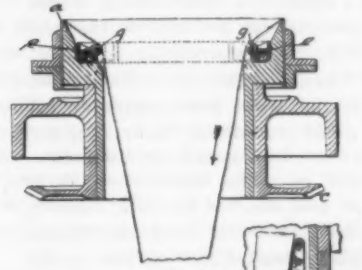


Fig. 1.

Fig. 3

Fig. 4.

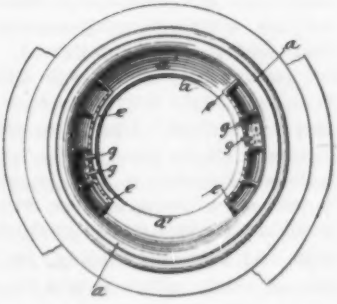


Fig. 2

may be adapted to run continuously or intermittently around the fabric, so as to produce a continuous or intermittent spiral design. To print intermittently, the said rollers may be formed sectional, or they may be adapted to run only half-way around the fabric.

Segmental troughs Fig. 1 and 2 e, adapted to be placed upon the annular recess a^1 of the cylinder a or upon a ledge on the latter are situated at a suitable point below this recess. This trough is divided into compartments containing coloring-matter, and one or more printing-wheels g, rotated by the downward travel of the knitted fabric.

The periphery of the wheel rotates in contact with the coloring-matter; which is picked up by the wheel, and deposited upon the exterior of the fabric in stripe fashion. By forming one side of the wheel in cam fashion, as shown in Fig. 3, and pressing same by a spring against a stationary cam-face a horizontal displacement of the wheel is effected, which produces a zigzag design on the fabric.

In place of the wheel g an endless printing-band g^3 may be employed, as shown in Fig. 4, to deposit the color on the fabric in stripes or checks.

The three arrangements of printing-wheels described produce a continuous longitudinal design; but by employing a wheel with a sectional printing-periphery and upon its shaft a driver rotated by frictional contact with the fabric, longitudinally intermittent designs may be produced.

New Knitting Mills.

In previous articles I have considered the erection and equipment of knitting mills, and will now say a few words about starting them. The first point to be decided upon is the class of goods to be manufactured, and after that point is settled, the best knowledge and experience should be utilized to arrange and equip the mill for the production of that particular line of goods.

The mills that are springing up in the Southern states prove that the people there are wide awake and begin to realize that there is money in the manufacture of cotton goods. In Georgia and the Carolinas, where I recently have been, many of the knitting mills are large, well appointed,

and filled with the best and latest improved machinery, with skilled operatives and everything necessary to turn out a product that will establish a high reputation for itself. There are, however, some mills not so well equipped. These latter do not succeed, and after a long period of discouraging struggle against adverse circumstances, wonder why they do not meet with the success that their neighbors obtain.

The trouble is that many of them start business with the idea that it is no very difficult undertaking to start a knitting mill. They think that all you have to do, is to get a few machines of different sizes, find a room with power, either water, steam or electricity, set up the machines, get anyone to teach them how to run the machines, and that their success will be certain. This is where they make a great mistake. The knitting business is like everything else. It must be done well in order to succeed.

The first thing to be considered is a good locality for power. If water power, see to it that it is good all the year around, and if so, it is the cheapest and best; but, if it is liable to fail at any part of the year, then it is good for "nix," for generally it fails when it is needed most.

Then the question of help is an important factor in the success of a mill. There must not only be plenty of help, but it must be efficient. It will not do to have the employees like many of the shirks and drudges whom we see around mills, who would rather play than work.

The question whether a mill should buy or spin its own yarn, depends, in my estimation, entirely upon the bank account back of the mill. If possible, the yarn should be carded and spun in the mill, as there is as much profit in making yarn as in making goods.

Assuming that the mill is in the South, the question arises as to where the goods are to be sold, whether in the home market or in some of the leading commercial centres like New York or Philadelphia. I believe that Southern mills of moderate capacity will find it much more profitable to market their goods near the mill, and, if possible, the policy of selling direct should be adopted.

To return to the question of help, it is a very important one in the success of a mill, and the difficulty is that today there are so many of our employees to whom mill work is a drudgery. They do not like the employment, and, consequently, are unwilling or reluctant laborers. Work of any sort where interest is lacking constitutes drudgery, whether it be sweeping a floor or superintending a mill.

Today, the chief anxiety of the employer is to get reliable help, and to mill workers generally, I would say: "Imagine that you have changed places with your employer. What would you think of an employee of yours who cared as little for, and paid as slight attention to, the work as you do now?" The chances are that you would not keep such an employee long in your service.

It would make a vast difference in the production, quality, and cost of goods if employees took delight in their duties, sought to enlarge them, studied how to make them more and more important, contrived to find time for any additional work required of them, and disregarded fatigue.

I regret that so many mill workers take such slight interest in their employers' welfare. They are waiting anxiously all the time for the whistle to blow, or the bell to ring. Recently, I was placed in a position where I could observe this fact to good advantage. At noon and evening, the employees would collect around the exit of the mill five or ten minutes previous to the time for the whistle to blow, and eagerly wait to rush out as soon as the gate began to move, and those who were the most anxious to get out were the last to return to work, and it was remarkable how long the distance between the mill entrance and the loom was when the employee was going to, and how short it was when he was quitting work.

OLD SUPERINTENDENT.

SILK DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Calculating the Cost of Silk Goods.

The accompanying chart shows a blank form used for estimating the cost of silk goods in one of our most successful mills. The calculation is based on 100 yards of finished goods. Use of this number enables the division of the total by the number of yards to be done mentally, so that the total cost of 100 yards indicates at the same time the cost per yard.

One hundred and ten yards of warp is allowed for 100 yards of finished goods. This may be more than is necessary on some fabrics. Taffetas, which are now so popular, will take up nearly this amount, while the take-up on satin duchesse and similar goods may not be over six per cent. Where a close calculation is desired, the length of warp for 100 yards of finished goods can be varied to suit the fabric in question.

In calculating the filling, we take the width in the reed, and not the finished width. Careful tests have shown us that this method is very accurate. As the goods "creep up" lengthwise after being woven, and as it is customary to pay for picking and weaving by the length of the goods as they come from the loom, 99 yards is taken as a basis. This loss in length, however, is recovered in the subsequent processes.

The item of waste, under the head of "Particulars of Cost of Silk," refers only to the waste made in throwing the silk; this varies from one-half to two per cent. for organzine, and from three-quarters to three per cent. for tram. The writer's opinion is, that with care in throwing, the waste on organzine, unless the stock is unusually bad, should not exceed one per cent., and can be kept down to one-half per cent. Our own experience has shown that on tram stock thrown by ourselves, out of properly selected material, six-tenths of one per cent. will cover the waste.

The outside throwster makes at least two per cent. of waste. On tram, however, it is well not to count on less than 1½ per cent., although we always figure two per cent. on organzine, and three per cent. on tram, in order to be on the safe side.

When manufacturers throw their own silk, the waste can be reduced to a minimum. When it is given to an outside throwster, it is greatly to the latter's advantage to increase the quantity of waste made. The waste made by the throwster is retained by him and sold for his own benefit, bringing from 40 to 50 cents per pound, and, moreover, by paying no attention to the amount of waste made, the throwster can put a much larger production through his machine.

If the amount of waste made by the throwster is so large as to cause a protest from the manufacturer, the thrown silk can be easily weighted, and in this way the manufacturer frequently imagines that he is getting silk thrown with very little waste, whereas the reverse is the fact. Boiling-off tests may reveal the imposition, but we understand that there are certain substances used to weight thrown silk, which will not come out in the boiling.

It will be noticed that the amount for twisting is marked to be divided

by 3. This is because it is customary to make the warps 300 metres long. Consequently, as the calculation is on 100 yards of goods, the amount to be paid to the twister is divided by 3, in order to obtain the price for twisting 100 yards.

The blank allows for four per cent. of waste on warp, and seven per cent. on filling. The waste made by us, ac-

COST CALCULATION.

Date_____ 189__

Pattern_____ **100 Yds.**_____ **Wide.**

Warp ____ Ends Organzine ____ Drams ____ lbs. @ ____ $____

110 Yds ____ " ____ " ____ " " ____ $____

____ " ____ " ____ " " ____ $____

Selvages ____ " ____ " ____ " " ____ $____

Total ____ " ____ " ____ " " ____ $____

FILLING. ____ Picks Tram ____ Drams ____ lbs. @ ____ $____

$____

Warping . . . 110 Yds. ____ Ends @ ____ per C. $____

Twisting ____ Ends @ ____ per M. = ____ ÷ 3 $____

Weaving, . . . 99 Yards, @ ____ $____

Picking, . . . 99 Yards, @ ____ $____

Finishing, . . . 100 Yards, @ ____ $____

Cards and Designs 100 Yards (on basis of 500 Yards made) $____

General Expenses, . . 100 Yards, @ ____ $____

(For Piece Dye) Dyeing and Finishing, . 100 Yards, @ ____ $____

(For Ptd. Wps.) Weaving before Printing, . 110 Yards, @ ____ $____

" " Printing, . . . 110 Yards, @ ____ $____

" " Re-beaming, . . . 110 Yards, @ ____ $____

" " Re-twisting, . . ____ Ends @ ____ per M. $____

Average Weight of 60 Yd. pce. ____ lbs. Net cost of pce. of 100 Yds., $____

Organzine weighted to ____ oz. Tram weighted to ____ oz.

4 per cent. is included in above figures for waste of warp.
7 " " " " " " filling.

Particulars of Cost of Silk.

	ORGANZINE.	TRAM.
Raw Silk,	$____	$____
Throwing,	$____	$____
Dyeing,	$____	$____
Winding,	$____	$____
Doubling,	$____	$____
Quilling,	$____	$____
Waste,	$____	$____
Total.	$____	$____

Conclusions.

Selling Price, . . $____

Com. and Discount, $____

Net Returns, . . $____

Net Cost, . . . $____

Net Profit, . . . $____

Weekly Product per loom, $____

Loom Earns per week, $____

cording to statistics which have been carefully compiled, has averaged between 2½ and three per cent. This does not take into account the remnant lots of tram or organzine remaining on bobbins, and which usually reach a considerable amount. Such lots may remain on hand a long time before an opportunity occurs for their use. During this time, the color is liable to fade and the value of the material deteriorates in other ways. We usually arrange, therefore, to have them re-reeled, twisted, and re-dyed black, so as to put the stock in shape for conversion into some salable fabric. This entails considerable cost, and the fabrics thus reduced generally are sold at a cut price; for these reasons the percentage of waste in the estimate is placed at the figures already stated.

The writer's opinion is, that the waste should not exceed three to 3½ per cent. for organzine, and five per cent. for tram. At the same time, with the ordinary indifferent management which prevails in many mills, four and seven per cent. are not excessive, whereas, with careless or questionable management, they might amount to considerable more.

The item of cards and designs will, of course, vary according to the trade. No two manufacturers will have the same experience in this respect. Sometimes many patterns will be made and not a yard sold from any of them, while at other times large orders may be secured from but one or two patterns. Some manufacturers charge the cost for designing and card cutting to the general expense account, but this does not seem the right method, as it may result in charging the cost of cards and designs to goods which require none of this expense.

In figuring the item of commission and discount, it is proper to include the cost for claims. Experience will teach each manufacturer the approximate amount of claims, both just and unjust. If the goods are sold six off, ten days, 60 days extra, through a commission house charging seven per cent. commission on net sales, and the records show that during the previous year only one-half per cent. was allowed for claims, it will be necessary to allow seven per cent. off for the customer (which is equal to six per cent. discount and one per cent. for the 60 days time), and one-half per cent. for claims; then, seven per cent. on the remaining amount for commissions.

We find it useful to have a table or card prepared, showing the selling prices of all the different fabrics in the line, beginning with the cheapest and extending to the highest priced goods. Opposite each fabric is placed the gross selling price, and also the net amount received by the mill. This system of tabulating cost can be extended to the material employed in the manufacture of goods, as well as the cost for various processes. In a business where the material is so expensive as in silk manufacturing, any guess-work in regard to cost or selling prices is liable to be very expensive to the guesser, and the greater the number of tabulations that a person can compile, the better, providing they save time and keep the experience of the past in plain view.

ANTI-GUESS.

—Prominent silk manufacturers of Paterson, N. J., have started a movement having for its object the passage of a law by Congress to prevent the overweighting or "dynamiting" of silk goods.

—To promote the production of silk in France, which had fallen from 23,285,880 lbs. of cocoons in 1894 to 15,385,346 lbs. in 1899, the government offered a bounty of 5¼ cents per pound of cocoons. This has resulted in a production of 20,196,889 lbs. in 1900, or an increase of over 30 per cent. in one year. There were 136,214 silk cultivators in France in 1900, and according to the government report 205,584 ounces of grain were used, producing 98 lbs. of cocoons per ounce of grain.

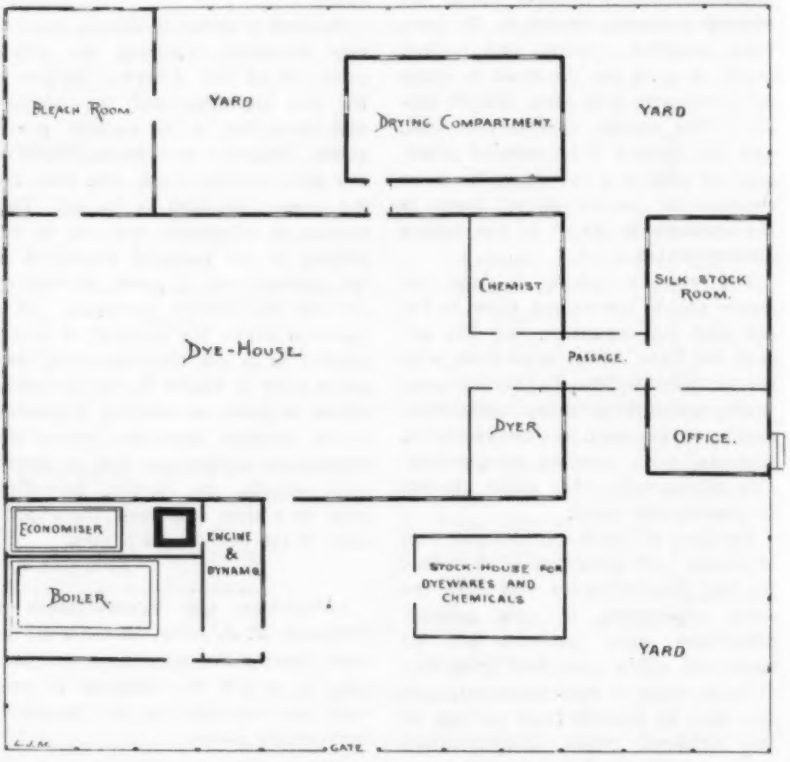
A Model Silk Dyehouse.

NO. I.

In the design and construction of modern dyehouses and bleach works, the engineer of the present period is enabled to make use of many machines, devices, and expedients to facilitate operations, that were not possible years ago, but in making choice of labor-saving appliances, many features of the special work to be done require very careful consideration, and this is nowhere else more noticeable than in the silk industry, from the fact that the raw material handled is of such high initial cost.

Of the various textile industries, none has departed less from the old established methods of working than that of silk, and particularly so of the dyeing: true, new dyes and coloring matters have been introduced from time to time, but their introduction in the silk dyehouse has been so gradual that radical changes do not occur.

Comparisons of silk dyehouses of today with those of fifty years ago, show marked changes in methods of handling the yarns, etc., but these changes came about so gradually that no date can be fixed marking the old and new.



GENERAL PLAN OF SILK DYE-HOUSE.

It is not our purpose to discuss the interesting history of silk yarn bleaching and dyeing, but to present to our readers a series of plans of an up-to-date silk yarn dyehouse, embodying the essential features necessary for the thorough handling of 10,000 pounds of yarn per month, making due allowance for proportionate amounts of some of this quantity to be bleached, dyed black, and in colors.

Provision is also made for a complete installation of steam for heating purposes, and such power as is required, and for drying, etc., for a chemical laboratory and small works for the preparation of such chemicals and mordants as can be made economically, and such other conveniences as have suggested themselves for a thoroughly complete plant.

An examination of the main plan shows that the detached system has been adopted as far as circumstances would allow. The office of the superintendent and the silk stock room are in one building, as offering the least risk in case of fire; communication is had with the main building by means of a covered passage, leading to an entry under the roof of the dyehouse, and separating the head dyer's office from the chemist's laboratory.

Independent of the main dyehouse, but close thereto on the right, is a small building constructed wholly for drying purposes, while on the opposite side is a frame structure for the accommodation of chemicals and heavy dye-wares in bulk.

At the rear, and to one side of the dyehouse, in a wing, is the bleach house, while on the opposite side is the power and steam plant.

As the dyehouse itself is the most important part of the entire plant, the aim has been to so arrange it that all parts would be equally accessible, and to utilize every square foot of space; this has been accomplished by placing in the centre of the floor the automatic washer and the whizzers, machines that are usually put in corners.

The several classes of work that an average silk dyehouse is likely to be called upon to perform, are separated as much as possible; for instance, black dyeing is given a corner by itself; color dyeing is given a range of tubs along one wall; the boiling-off vats are by themselves.

Of course such a division cannot be made hard and fast, as tubs, usually made use of for one special purpose, may occasionally be used for other purposes during a rush of one class of work.

The supply of water being the most important feature, this is to be provided by means of large pipes (3-in. diameter) under the false flooring.

Where there is much exhaust steam that is likely to go to waste, it is recommended to install a water heater, which will effect a considerable saving in steam in heating the dye vats.

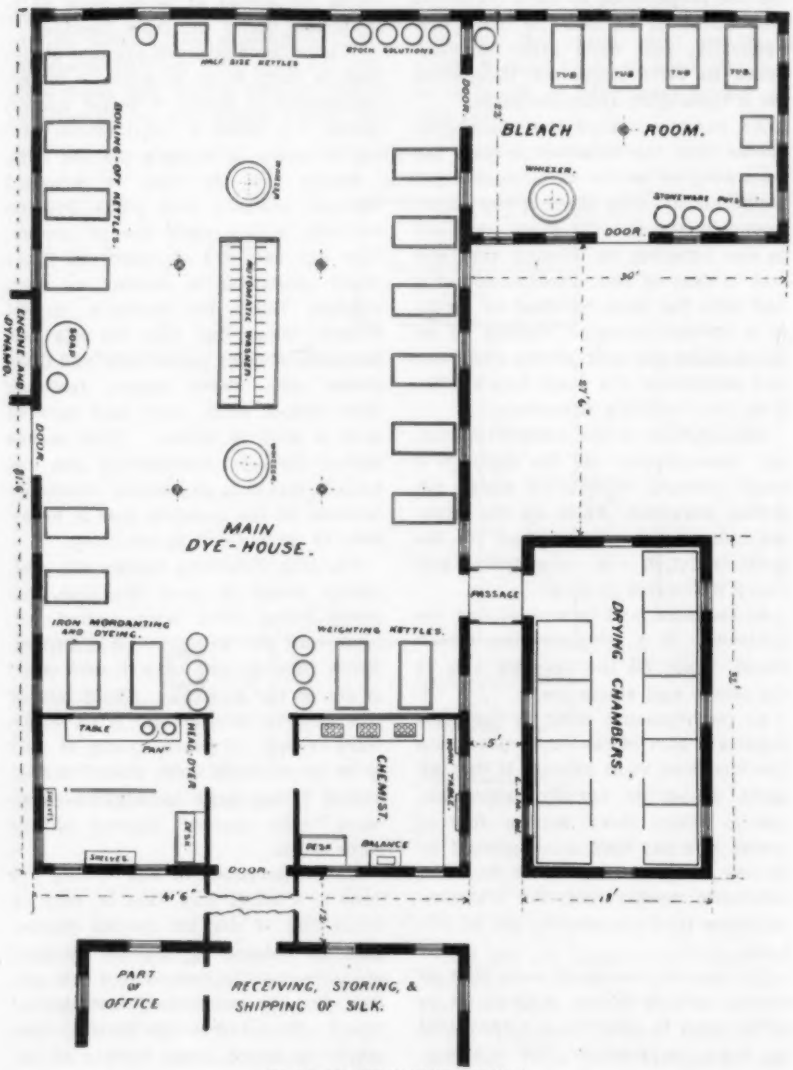
Steam for the vats is supplied through ordinary iron pipes, but the sections within each are of copper. The dye vats are of cedar, no other wood appearing to answer as well, cypress being the writer's second choice. Some dye tubs for silk can be made of good, sound pine and lined inside with sheet copper, fastened with copper nails, each nail covered with a drop of solder. This makes one of the most satisfactory silk dye kettles, but it is expensive, chiefly on account of the cleaning that is necessary to maintain it in condition.

The iron weighting kettles are preferably made of good flagstone, the joints being filled with melted sulphur, and the whole properly braced. Metal tubs do not answer, and wood is out of the question. Small lots of silk may be worked in large stoneware crocks. If black dyeing is only to be occasionally done, then it is suggested to use large rectangular stoneware "acid coolers" instead of the slate tanks.

Many operations of silk dyeing are done in a small way, that is, only on small lots of silk for special shades, and the volume of liquors required are consequently limited to a few gallons, for the economical handling of which the before-mentioned stone crocks or sound casks answer admirably.

The proper washing of silk is a matter of much concern to insure satisfactory results from dyeing, and the hand method is gradually giving way to the mechanical washing as performed by strong jets of water forced

at and through the yarn while it is suspended from rotating arms. There are several machines of this character, all based upon the original invention of Carron. The extraction of soap liquors, or by suspending it in bags; in either case the tubs are alike. Provision has been made for four tubs, close to a permanently mounted soap tank, near the centre of the dye-



PLAN OF SILK DYE HOUSE.

water from washed yarn before being dried, requires no mention, as the whizzers are too well known.

The important operation of boiling-off is carried out in two ways, either by hanging the silk directly in the house, to be easily reached by other workmen who may have occasion to use it.

A row of half-kettles is placed at one end of the dyehouse for small lots of silk. These are nearly always in

use, as they effect a considerable saving when small lots of special shades are wanted.

The main point in the ventilation of any dyehouse is to eliminate the "fog" or mist that prevails, chiefly during cold weather. The only practical way is to maintain a temperature sufficiently high to prevent a condensation of the moisture, and at same time to remove the saturated atmosphere by addition of fresh air. The latter can be accomplished by roof ventilators and wall openings, or what is still better, by mechanical draft.

From the main dyehouse a large door leads into a small wing which is set apart for bleaching; four large and two small tanks are provided for this purpose. The process here planned is for peroxide of hydrogen, which combines many features that are now thoroughly recognized. Ample space is provided for all necessary racks and carboys, making this room an independent department.

The dry room is located in an independent building of small, though convenient size, located close to the main building. It is frequently the custom to place the "dry room" over the boilers, but this is bad practice, as the sulphurous gases, which always arise, even from the best constructed boilers, have an injurious action on many delicate colors. Consequently, drying by steam in a separate room or structure is more rational. Revolving reels are useful for drying small lots of silk.

The power plant consists of a boiler of 125 horse power, and a small engine, together with a 30-light generating set. The boiler should be designed to supply steam for heating the various dye kettles, supplying the engines, and heating the various rooms. Working at its maximum capacity throughout the year, it will consume approximately 27 tons of coal per month. Located in a small alleyway between the boiler house and the dyehouse is a water heater and the chimney.

Just outside the main dyehouse, and opposite the engine room, is a structure designed to serve as a storehouse for stocks of dyewares, extracts, dyestuffs in kegs and bulk packages. This arrangement is much more satisfactory than encumbering the dyehouse or dyers' room with articles that should be placed elsewhere. From this building the dyers' immediate needs are supplied.

The shades are kept in the dyers' room, together with the dyehouse books, the dyestuffs in cans or other open packages of such materials as might be injured by the more or less moist atmosphere of the dyehouse. This room is equipped with a desk, table for the dyers' experiments, racks for thermometers, hydrometers, etc., and bottle shelves for the solutions of coloring matters that are used in small quantities, and also a small, steam-heated oven for drying swatches or trial skeins.

The laboratory is a feature of most silk mills that is receiving much attention at the present time, as it is now the custom to exercise a closer control over the supplies of all kinds that are purchased, and also to apply chemical knowledge to solve the various problems that continually occur in the silk business.

The laboratory should be supplied with suitable apparatus and reagents for both qualitative and quantitative chemical analyses; special consideration being paid to the examination of water, soaps, chemicals used in mordanting and dyeing, for ascertaining the identity of dyestuffs, and the valuation of heavy dyewares and tannins.

There should be at least two, six-hole, circular or rectangular chloride of calcium or glycerine baths for 500 c. c. porcelain beakers, heated over gas stoves, or in steam kettles. These are for making comparative dye tests, etc. Steam-heated, glycerine baths are now coming gradually into use, and before long, all laboratories will adopt them.

BETA-NAPHTHOL.

POWER DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

ELECTRICITY—STEAM—WATER.

Power Transmission.

Aside from the electric, hydraulic and pneumatic means of carrying power, the other systems may be divided into four groups: belts, ropes, friction and gears. Each has its advantages and objections; each requires certain conditions for the best results; and lastly, each system is accompanied by more or less loss of power.

The whole amount of power generated by the motor cannot be transferred to the operating machine owing to the loss of power from friction and inertia of the mass of material, and also the loss caused by stiffness of ropes and belts.

Experiments conducted in various factories by the Bavarian Steam Boiler Inspection Co., shed much light upon the question of what amount of power is consumed in transmission, and show that the power lost in this way depends to a large extent upon the manner in which the transmission apparatus is installed.

The first case cited is that of a brewery built two years ago. The plan of the shafting is shown at Fig. 1, and the following table shows

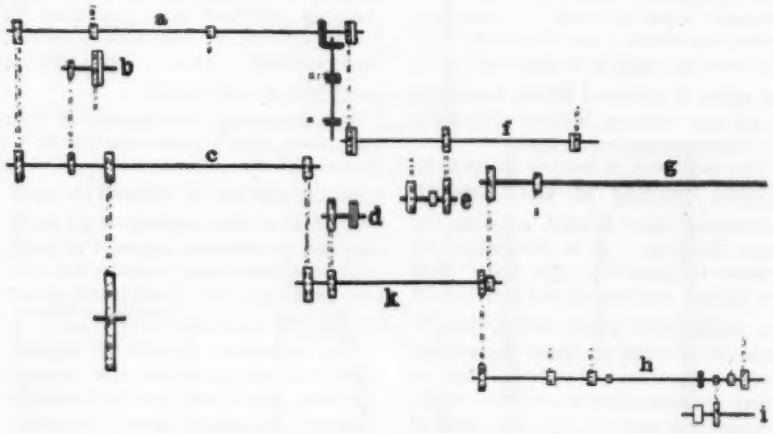


Fig. 1.

length, diameter and speed of the shafting:—

Shaft.	Length.	Diam.	Rev. per min.
A	40 ft.	2¾ in.	86
B	7	3¼	250
C	43	3¼	200
D	6½	2¾	80
E	10	2¼	144
F	36	3	90
G	49	2¾	92
H	41	3¼	95
I	11	3¼	24
K	27	3¼	95
	279½		

The experiments in this plan showed that the engine consumed 10 2/10 H. P., or 12 3/10 per cent.;

a compressor connected directly with the engine, 25 H. P., and the transmission 9 9/10 H. P., or 12 per cent., leaving 37 9/10 H. P., or 75 7/10 per cent. for use by the machines.

The second example was that of a wood-working establishment. The indicated power during a period of 7½ hours was 32 2/10 H. P. The engine alone consumed 3 3/10 H. P., or 10 per cent.; the transmission, 7 9/10 H. P., or 24½ per cent.; leaving 21 H. P., or 65½ per cent. for the machines.

Fig. 2 shows these results in graphic form. The horizontal line,

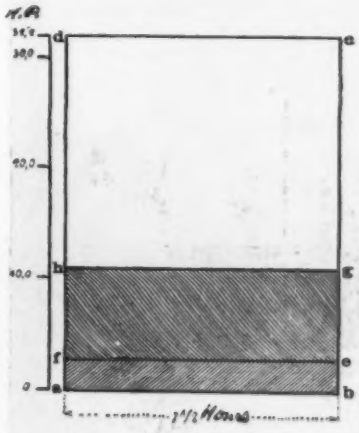


Fig. 2.

a b, represents the time, 7½ hours; the upright line, a d, represents the total indicated horse power, 32 2/10. The upright line is divided to show the power consumed by the engine, a f, the space a f e b representing the power for the 7½ hours; the power consumed by transmission is represented by f h, and for the 7½ hours by space f h g e; the power available for the machinery is represented by h d, and for the 7½ hours by the space h d c g.

The next example is taken from a textile mill. Tests covering a period of eight hours indicated 347 H. P. distributed as follows: Engine, 30 H. P., or 8 6/10 per cent.; transmission, 75 H. P., or 21 6/10 per cent.; leaving 242 H. P., or 69 8/10 per cent. for the machines. These results are shown in the chart Fig. 3.

The cost for power consumed by engine, and transmission, in the textile mill, is shown by the following calculation, assuming a consumption of 22 lbs. steam per horse power per hour, and that one pound of coal will make 7 lbs. of steam. The calculation is for 10 hours working time. $(10 \times 22 \times 105) \div 7 = 3300$ lbs. coal consumed in 10 hours, which at $4.30 per ton would amount to $7.10.

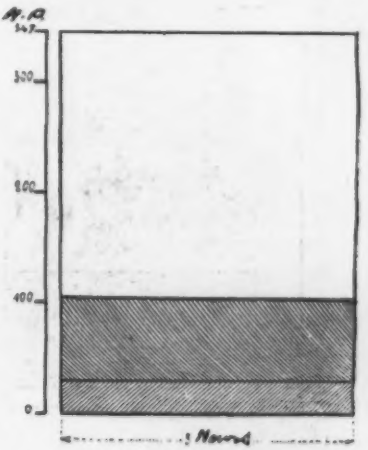


Fig 3

By a similar method we find the cost of coal consumed by engine and transmission in the wood-working shop previously mentioned to be $1.14; in the latter case, owing to smallness of the plant, we assume a consumption of 15 lbs. of coal per H. P. per hour. In addition to this cost of fuel there is the cost of oil, attendance, repairs, and wear, which should be added.

The power consumed in transmission depends largely upon the manner in which the plant is erected, and attention is called to the following important points: Solid buildings, enabling shafting, etc., to be kept true; locating of engine in centre of works,

in order to bring machinery as near motive power as possible; placing the machines requiring the most power nearest the engine. — Technische Rundschau.

Development of the Electric Drive.

Sidney B. Paine, of the General Electric Company, in an interesting article traces the development of the electric transmission of power which has taken place within a comparatively brief period. The rapidity of this development is well illustrated by the fact that at the Centennial Exposition, in 1876, electric illumination was shown as a laboratory experiment. A little over twenty years ago Edison suggested the possibility of subdividing the electric current by using incandescent lamps. The first successful attempt to transport passengers by electric railway was made only fourteen years ago.

A year ago, there were about 13,000 horse power of electric motors. First adopted by the Columbia Mills, Columbia, S. C., the electric drive has steadily risen in the estimation of manufacturers. The Boston Duck Company, Bondsville, Mass., was among the first to use the electric drive on an extensive scale. This plant consists of one 600 H. P. generator, and a similar machine used as a motor, and has been so successful in the saving of fuel that it has repaid the investment in the electrical apparatus.

The next step in the development of the electric drive was at the Columbia Mills. A canal had been built originally to allow boats to pass around the rapids of the Congaree River. The canal was between the river and the mill, and either a costly tailrace would have to be built under the canal, or the mill would have to be driven by a long rope drive. The electric system had not up to this time been used on a large scale. The engineers and owners, however, finally decided to place their sole dependence upon what was then but a theory, and the results obtained during the six years this mill has been in operation have entirely justified their judgment.

COLUMBIA MILLS, COLUMBIA, S. C.

Persuaded by the success at Columbia, the Pelzer Manufacturing Company decided to carry over 3,000 H. P. nearly three miles to their new mill, and today this mill is operating as successfully as any of the later installa-

tions. The success of the Columbia Mills' electric plant induced the Columbia Motor Power Company to erect a large power house, capable of accommodating eight generators of 1000 H. P. each, and connected direct with the water wheels. From these are driven the Granby Mills, 1½ miles

POWER HOUSE, COLUMBIA WATER CO.

away, and also the Palmetto Mills, which have been equipped with 200 H. P. motors.

Following these pioneer installations, came in quick succession the electric power plants installed by the Hadley Thread Company, Holyoke, Mass., the Jackson Company, Nashua, N. H., Amoskeag Company, Manchester, N. H., Washington Mills, Lawrence, Mass., and the Wamsutta Mills, New Bedford, Mass.

The Anderson Cotton Mills, Anderson, S. C., were the leaders in the adoption of the next step in the development of this electric power system. It was decided to drive the spinning room in this mill by means of small motors, each motor being placed between two spinning frames, and connected to them on either side by friction clutches. This dispenses entirely with all belting for driving the spinning machinery. The current is received from Portmann Shoals, ten miles distant, and between the water wheel and the spinning frame, there is not a single belt or auxiliary shaft.

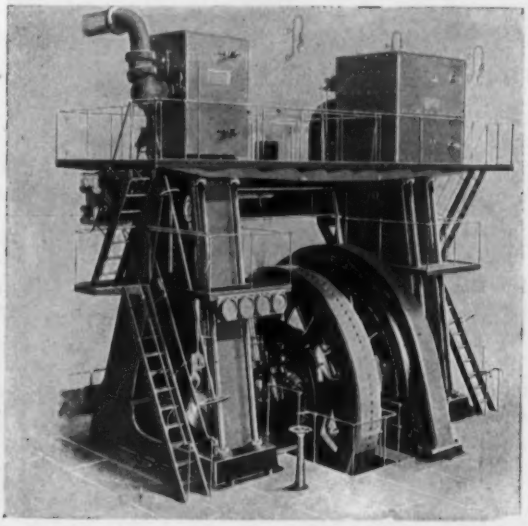
GRANBY MILLS.

Mr. Paine states that he has made many tests of machinery driven by electricity, and also of machinery driven by mechanical methods, and he finds that where driven by belts there is a large loss in

speed of spinning frames, due to the slipping of the various belts between the engine or water wheel and the frame. In one case, he found the speed of the front rolls to vary from 103 to 120 revolutions, and by connecting one of these frames with an electric motor the variation was kept between 120 and 122 revolutions of the front roll. The generator supplying current to this motor was operated by the same engine which drove the other frames. The belts on all of the frames in the room were tightened, and the minimum speed raised from 103 to 113, showing the loss due to the slipping of belts. The difference between 113 and 120 revolutions was accounted for by the fact that it is impracticable to make the various pulleys the exact diameter required, and also due to a small extent to the fact that as the belts stretched, they became thinner, thus reducing the belt speed.

In another mill, where the owner claimed there was not over one per cent. of loss in the speed, he admitted after the test that there was a variation of at least nine per cent.; in another mill was found a variation of 15 per cent. between the different frames in the same room.

The Lancaster Mills, Clinton, Mass., were compelled to change their motive power, on account of the Metropolitan Water Board, of Boston, condemning the water power on the Nashua River, and it was decided to locate their engines at some distance from the mill and drive the machinery by generators and motors. A year after this installation, it was found desirable to displace some of the old engines which had been retained, and the results obtained with the electric drive had been so successful that a second engine of 2,200 H. P. was contracted for, which is to be connected with the generator.



GENERATING SET OF THE AMERICAN WOOLEN CO.

The American Woolen Company have contracted for a 2,700 H. P. generator and engine, to be used at the Washington Mills, Lawrence, Mass. This plant is shown in the illustration. A comparison during a period of two years between the power plant of the Granby Mills, which is driven by electricity, and that of the Richland Mills, Columbia, S. C., where steam power is employed, was so favorable for the electric system that when the Olympia Mills, Columbia, S. C., was planned, it was decided to drive it throughout by motors. The illustration shows the Olympia power plant, which consists

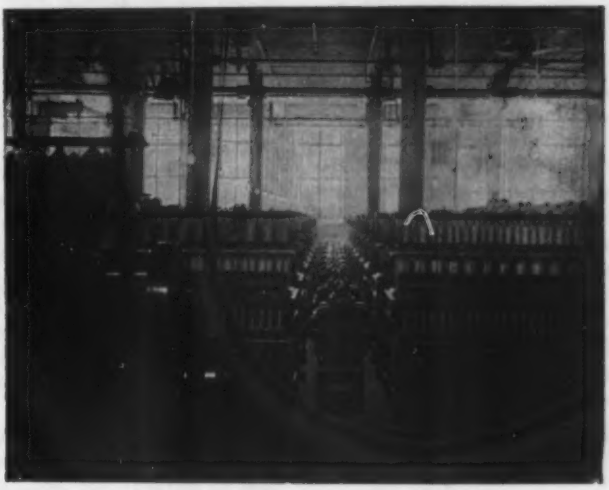
of three generators, each of 1,700 H. P. capacity, connected direct with electrical cross compound engines. The Olympia Mill is the first in this country to be especially designed and built for the use of electric power, where the generators are driven by steam engines, and the following list shows the latest steps in this phase of the development of electric power.

	GEN.	H.P.	REV.
Lancaster Mills, Clinton, Mass.	1	1600	75
Lancaster Mills, Clinton, Mass.	1	2200	70.5
Olympia Mills, Columbia, S. C.	3 ea.	1700	133
Buffalo Cotton Mills, Union, S. C.	1	1700	133
Ludlow Mfg. Co., Ludlow, Mass.	1	1000	120
American Thread Co., Holyoke, Mass.	1	800	150
American Woolen Co., Lawrence, Mass.	1	2700	120
DeKalb Cotton Mills, Camden, S. C.	1	600	150
Seneca Cotton Mills, Seneca, S. C.	1	600	150

He sums up the advantages of the electric drive as follows: Subdivision into independent sections, each driven by its own motor; variation in speed due to slipping of belting is avoided; less liability of shut-downs, as the mill is not dependent upon one main shaft; permits the operation of one or more sections of the mill over time, without operating the shafting in other sections; less difficulty in keeping the shafting in line; uniformity of speed and size of shafting efficiency; the loss of power between prime mover and motors being estimated at 16 to 18 per cent.; improved light and ventilation, owing to the location of the power house away from the mill; additions to the power plant can be easily made; the power required to operate any section may be readily measured; the generating plant may be subdivided into two or more units without reduction of efficiency; concentration of manufacturing buildings and possibility of arranging them to the best advantage as regards manufacturing, without regard to the power plant.

The Use of Iron in Mill Construction.

The question of using iron instead of wood floor beams in cotton mill construction, has come to the front in



SPINNING ROOM, ANDERSON COTTON MILLS.

the last few years in a manner that strongly suggests that before a great many more years pass the iron beams will be used very largely if not almost entirely in the construction of modern mill buildings.

In comparing the relative values of the two materials for the purpose in question, it is well to remember that the fact that the insurance companies have on the whole been unfriendly to the use of iron beams, or rather unprotected iron beams, has prevented a large number of people from even

looking into their merits as compared to beams of wood. The widely proved fact that a large number of buildings have been totally wrecked by the expansion of iron beams even before the fire in the building has reached such a stage that there seemed no possible chance of putting it out, has of course justified the insurance men in the stand that they have taken on the question. Today however there are a number of systems on the market that claim to provide efficient protection to the iron work in case of fire, and to retard the heat from reaching the iron sufficiently to do any harm until at least the fire has obtained such control that there is no possible hope of saving the building.

The wood beam in a burning building is perfectly safe until the fire chars it away enough to make it too weak to support the load resting on it. In the case of large beams this means a considerable length of time, and the firemen can enter the building to fight the fire without the fear that the beams may expand enough at any moment to force out the walls and wreck the whole structure.

In looking on this side of the subject it is only fair to assume that the chances of fire in a modern well sprinkled mill are very small, and that, should one occur and the beams be protected by some good non conducting substance, the risk of damage would be reduced to a minimum, so that the greater reliability of the wood beams in a fire will not perhaps be of such vital moment as might appear on first thoughts.

Wood beams of a sufficient size to carry their load in the modern length of span commonly used, without undue deflection, are expensive; built up beams can, of course, be used, but here again the question of expense is an important one. On the other hand the mill engineer simply figures out what size of iron beam is required under the given conditions to support the load, as beams of any sized section are readily obtainable.

The cost of the two different materials varies with local conditions, and market conditions; in some cases iron may be cheaper than the wood, and at other times and locations considerably more expensive. Whatever the relative first cost of the two materials I am convinced that the iron beam is the cheapest in the long run on account of the much greater stiffness of a floor resting on iron beams as compared to wood. This means that the machinery having a better foundation runs more easily, consequently with less wear and tear and fewer repairs.

Some few years ago I put some machinery into a mill at that time only about a year old, and the floor beams supporting the cards had sprung some two inches and a half in the centre of their span. The floor beams in this case were as heavy as are ordinarily used; the cards in this mill were set across the mill instead of lengthways as is customary in order to get a greater number of cards on a given floor space; this resulted in throwing a very heavy load on the beams with the result as stated. The mill people claimed in this case that the only way to get wood beams to carry the load was to use heavy iron fish plates on each side of the beams with through bolts at short distances apart

There is another point in favor of the iron beam; it is built solidly in to the wall, and consequently the brickwork is as strong as at any other place; with the wood beam it is necessary to leave an air space around the beam and as a result the wall is weakened.

Another point of great value in buildings such as dye houses is the fact that iron beams will last for an indefinite time while wood beams are not good for over eleven or twelve years before they rot out badly enough to make the floor unsafe. To any one who has had the work of replacing the beams in a dye house this means a great deal, for moving the boxes, disconnecting the piping and taking out the old floor and beams and putting in new is an expensive job.

MECHANIC.

DYEING DEPARTMENT

Dye Recipes for January.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Recipe No. 33.

Rose Red on Cotton Yarn.

Diamine Rose G G N on 100 lbs. of cotton yarn.

Prepare the dye bath with

1 lb. Diamine Rose G G N.

(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

20 lbs. Common Salt.

1 lb. Soda Ash.

Enter yarn at 160° F., bring to a boil, and dye at this temperature about one hour.

Diamine Rose G G N, like former brands of Diamine Rose, dyes fine level shades and possesses excellent fastness to light. It is rather bluer than Diamine Rose G D.

Recipe No. 34.

Blue on Cotton Yarn.

Diamine Blue A Z on 100 lbs. of cotton yarn.

Prepare the dye bath with

3 lbs. Diamine Blue A Z.

(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

20 lbs. Common Salt.

1 lb. Soda Ash.

Enter yarn at 160° F., bring to a boil, and keep at this temperature for about one hour.

Diamine Blue A Z, producing as it does, bright navy blue shades on cotton, should prove a useful addition to the other well-known brands of Diamine Blue. It is rather bluer in shade than Diamine Blue 3 R.

Recipe No. 35.

Scarlet on Cotton Yarn.

Columbia Fast Scarlet 4 B on 100 lbs. of mercerized cotton yarn.

Prepare the dye bath with

4 lbs. Columbia Fast Scarlet 4 B. (2.5 lbs. for Standing Bath.)

(Berlin Aniline Works, 72 Front St., New York.)

40 lbs. of Glauber's Salt (calcined)

1 lb. Soda.

Enter at 160°, and dye at a temperature between this and the boiling point.

Columbia Fast Scarlet 4B possesses all the characteristic properties of the direct cotton colors, and is faster to light and acids than Benzo Purpurin.

Recipe No. 36.

Brown on Cotton Yarn.

Pyrogen Brown D on 100 lbs. of cotton yarn.

Prepare the dye bath with

15 lbs. Pyrogen Brown D.

(A. Klipstein & Co., 122 Pearl St., New York.)

15 lbs. Sodium Sulphide.

5 lbs. Sodium Carbonate.

60 lbs. Common Salt.

Enter yarn at 150° F., bring slowly to 190° F., and dye at this temperature for one hour, being sure to keep the yarn below the surface of the dye liquor.

When the dyeing is finished, pass the yarn immediately through a wringer, allowing the dye liquor to run back into the dye bath, and then

wash in cold water.

Pyrogen Brown D gives a very fast shade of brown on cotton yarn.

Recipe No. 37.

Brown on Cotton Yarn.

Direct Imperial Brown on 100 lbs. of cotton yarn.

Prepare the dye bath with

4 lbs. Direct Imperial Brown.

(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)

20 lbs. Common Salt.

Enter the yarn at 160° F., and while turning bring to a boil, and dye at this temperature for one hour. Wash and dry.

Direct Imperial Brown gives a rich and full shade of brown, goes on the fibre gradually, and dyes very evenly. The bath is not exhausted, and future shades will require about one-third less dyestuff. The shade produced is quite fast to light and washing, and very applicable to hosiery dyeing.

Recipe No. 38.

Red on Worsted Yarn.

Anthracene Red B N on 100 lbs. of worsted yarn.

Prepare the dye bath with

3 lbs. Anthracene Red B N.

(C. Bischoff & Co., 87-89 Park Place, New York.)

20 lbs. Salt.

Enter at 160°, bring slowly to a boil. After boiling one-half hour, add during next half hour, 3 to 5% of acetic acid.

To increase fastness to fulling the material may be after-treated with 2% of potassium of di Chromate. This dyestuff may also be applied on a chrome bottom.

Anthracene Red B N produces deep red shades which possess excellent fastness to light, alkali and ironing.

Recipe No. 39.

Blue on Worsted Yarn.

Alizarine Blue L P on 100 lbs. of worsted yarn.

Mordant the yarn in a bath made up with

3 lbs. Potassium Di Chromate.

2 lbs. Tartar.

Enter yarn at 140° F., bring to a boil and mordant at this temperature for one and one-half hours.

Then dye in a bath made up with

20 lbs. Alizarine Blue L P.

(Anchor Color Manufacturing Co., 462 Cherry St., New York.)

1½ lbs. Acetic Acid.

Enter goods cold, bring slowly to a boil, and dye at this temperature one and one-half hours.

Alizarine Blue L P gives a fast bright bloomy shade of blue at a moderate cost.

Recipe No. 40.

Green on Worsted Yarn.

New Acid Green G X on 100 lbs. of worsted yarn.

Prepare the dye bath with

1 lb. New Acid Green G X.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

10 lbs. Glauber's Salt.

adding gradually

5 lbs. Sulphuric Acid.

Enter the yarn at 170° F., bring to a boil, and dye at this temperature one hour.

New Acid Green G X produces brilliant and clear shades of green, and is valuable for piece dyeing and wool and silk printing.

Recipe No. 41.

Blue on Cotton Yarn.

Diphenyl Blue 5 G on 100 lbs. cotton yarn.

Prepare the dye bath with

2 lbs. Diphenyl Blue 5 G.

(John J. Keller & Co., 104-106 Murray St., New York.)

25 lbs. Common Salt.

Enter at 170° F., bring to a boil, and dye at this temperature one hour.

Diphenyl Blue 5 G is fast to acids, stands hot pressing without change of shade, and is reasonably fast to washing.

Recipe No. 42.

Black on Cotton Yarn.

Niagara Black M B on 100 lbs. of cotton yarn.

Prepare the dye bath with

4 lbs. Niagara Black M B.

(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

20 lbs. Common Salt.

Enter at 160° F., bring to a boil and dye at this temperature for one hour.

Niagara Black M B possesses a high tinctorial power and goes on the fibre evenly.

Recipe No. 43.

Red on Worsted Yarn.

Anthracene Red B N on 100 lbs. of worsted yarn.

Prepare the dye bath with

5 lbs. Anthracene Red B N.

(C. Bischoff & Co., 87-89 Park Place, New York.)

20 lbs. Common Salt.

Enter at 160°, bring slowly to a boil. After boiling one-half hour add during next half hour 3 to 5% acetic acid.

To increase fastness to fulling the material may be after-treated with 2% of potassium di chromate. This dyestuff may also be applied on a chrome bottom.

Anthracene Red B N produces deep red shades, which possess excellent fastness to light, alkali and ironing.

Recipe No. 44.

Brown on Cotton Yarn.

Cachou de Laval R on 100 lbs. of cotton yarn.

Prepare the dye bath with

5 lbs. Cachou de Laval R.

(The St. Denis Dye Stuff and Chemical Co., Sykes & Street, 85 Water St., N. Y., Sole U. S. Agents.)

1 lb. Common Salt for every gallon of water.

2 lbs. of Soda Ash.

Enter the yarn at 180°, bring to a boil and dye at this temperature one hour.

The yarn is then after-treated for one-half hour in a bath containing

5 lbs. of Copper Sulphate.

5 lbs. of Common Salt.

Enter at 120° F., and bring to 170° F. toward the end of the operation.

Cachou de Laval R is a concentrated type of this very important dyestuff.

Recipe No. 45.

Yellow on Cotton Yarn.

Tetrazo Yellow R on 100 lbs. of cotton yarn.

Prepare the dye bath with

2 lbs. Tetrazo Yellow R.

(New York & Boston Dyewood Co., 55 Beekman St., New York.)

20 lbs. Na_2SO_4.

1½ lbs. Soda Ash.

Enter at 170° F., bring to a boil and dye at this temperature for one hour.

Tetrazo Yellow R gives an even and full shade of yellow, and possesses all the characteristic properties of the direct cotton colors.

Recipe No. 46.

Violet on Cotton Yarn.

Columbia Violet R on 100 lbs. of mercerized cotton yarn.

Prepare the dye bath with

¼ lb. Columbia Violet R.

(Berlin Aniline Works, 72 Front St., New York.)

10 lbs. Glauber's Salt.

2% Soap.

Enter at 180°, and dye at a boil or a little below.

Columbia Violet R possesses all the characteristic properties of the direct cotton colors, and its fastness to light is equal to the best of the direct cotton colors.

Recipe No. 47.

Brown on Cotton Yarn.

Cachou de Laval R on 100 lbs. of cotton yarn.

Prepare the dye bath with

10 lbs. Cachou de Laval R.

(The St. Denis Dye Stuff and Chemical Co., Sykes & Street, 85 Water St., N. Y., Sole U. S. Agents.)

1 lb. of Common Salt for every gallon of water.

2 lbs. of Soda Ash.

Enter the yarn at 180° F., bring to a boil and dye at this temperature one hour.

The yarn is then after-treated for one-half hour in a bath containing

5 lbs. of Copper Sulphate.

5 lbs. of Common Salt.

Enter at 120° F., and bring to 170° F. toward the end of the operation.

Cachou de Laval R is a concentrated type of this very important dyestuff.

Recipe No. 48.

Cerise on Cotton Yarn.

Rosazeine 4 G on 100 lbs. of cotton yarn.

Mordant yarn with tannin as follows:

Enter at 130° F., in a bath containing 8 lbs. of tannin or an equivalent of light sumac extract, turn for twenty minutes at this temperature and then sink for twelve hours. Lift the cotton, wring without washing, and work for 20 minutes in a cold bath containing

2 lbs. Antimony Salt.

Wash thoroughly and dye in a bath containing

2 lbs. Rosazeine 4 G.

(Victor Koechl & Co., 122 Hudson St., New York.)

2 lbs. Alum.

Enter at 120° C., bring slowly to 160° to 170°, and dye at this temperature for three-quarters of an hour.

Rosazeine 4 G resembles the Rhodamines in properties, but possesses greater brilliancy. It is valuable in the topping of direct cotton colors.

—The silk manufacturers of St. Ettienne, France, according to a U. S. Consular report from that city, fear the effects of American competition in silk goods. One of the leading commission men in the silk trade of Lyons and St. Etienne is quoted as follows:

"Just as surely as American iron products—bridges, machinery, etc.—have found a permanent market in Europe, so will American silks and other textile goods; and the time has almost arrived."

—The science of happiness is to love duty and search for pleasure.—Dash.

—The idea which we have failed to retain is like the handsome woman that we see disappear at the turning of the street.—Voltaire.

Process of Dyeing.

A resident of Berlin has patented a process of dyeing in this country.

He states that it is well known that colors fast to milling may be produced on wool fibre by the formation of lakes. For this purpose the woolen goods are mordanted with chromium compounds and subsequently boiled in a solution of the dyestuff.

The feature of the mordanting process consists in impregnating the material to be mordanted with a boiling solution of potassium or sodium bichromate with certain assistants, which serve to decompose the bichromate and simultaneously to reduce the chromic acid thus formed.

Suitable additions are tartar, oxalic acid, lactic acid, or lignorosin, in combination with sulfuric acid. Sulfuric acid alone or boro-sulfuric acid or certain other additions sometimes employed set free the chromic acid without reducing it. Hence the reduction can only take place by affecting the wool fibre. The patentee claims that by substituting for the above-mentioned assistants neutral ammonium salts—for instance, ammonium-sulfate—a mordanting bath of most valuable properties is obtained.

The new mordanting bath, prepared from potassium bichromate and ammonium-sulfate, is neutral in the beginning, but becomes slowly acid on boiling, a part of the ammonium-sul-

fate decomposing and ammonia being given off. The latter escapes or reduces the small quantities of chromic acid, which at the same time have been set free.

Further nitrogen, water, and lower oxides of chromium are formed, which latter immediately become fixed upon the wool fibre. It is evident that in the way described the mordant is but slowly, and therefore most evenly, deposited on the fibre. Moreover, if a sufficient quantity of ammonium-sulfate is added, the bath may be almost completely exhausted.

The following directions are given:

1. Dissolve in boiling water one pound of potassium bichromate, one pound of ammonium-sulfate, and one pound of anthracene-red in a vat of two hundred gallons. Enter with one hundred pounds of slubbing and connect with a pump. Work for two hours until the bath is exhausted. Rinse and dry.

2. Dissolve in boiling water one pound of chrome fast yellow R, one pound of potassium-bichromate, and one pound of ammonium-sulfate in a vat of three hundred gallons. Enter with fifty pounds of worsted yarn at a moderate temperature, lift six times, and raise the temperature slowly to the boil and dye, gently boiling until the bath is exhausted.

3. Dissolve in boiling water 7.5 pounds of the azo-dyestuff paste obtained from diazotized picramic acid and meta-toluylene-diamine (respectively equivalent proportions of the dyestuffs obtained from diazotized picramic acid and chloro-phenylene-diamine, $Cl : NH_2 : NH_2 = 1 : 2 : 4$ or $1 : 3 : 5$), 1.5 pounds of potassium-bichromate, and 1.5 pounds of ammonium-sulfate in a piece-vat of two hundred gallons, enter with seventy-five pounds of worsted goods at a moderate temperature, and work for fifteen minutes. Raise the temperature slowly to the boil and dye, boiling until the bath is exhausted.

—Liberty is the right to mind other people's business.—Galiani.

The Use of Mordant Dyes in Printing Cotton Goods.

While the basic dyes came into great favor on account of their brightness, they were by no means fast to light and washing. The mordant dyes, on the contrary, are not so bright, but are, on the average, superior as regards fastness to light and washing. This is true particularly of most of the alizarine dyes. Alluminum, chrome, iron, nickel, zinc, lime, magnesia and tin salts are employed as mordants for these mordant dyes. It has been found that in many cases a dyestuff produces better results with some particular mordant. For instance, acetate of chrome produces a good green with Alizarine-viridin F F. The same mordant answers well for the production of gray and black, with Alizarine Blue Black 3 B, and also for colors made with Diamine Orange, Brilliant Alizarine Blue S D, and Brilliant Chrome Red.

For other dyestuffs, such as Alizarine Blue S, Zinc vitriol, or Acetate of Nickel can be used as mordants. The shades produced by the last named mordants are brighter, but not so fast to washing as those obtained by the use of the acetate of chrome. Sometimes the chrome and nickel mordants are mixed. Acetate of chrome as a mordant for Anthracene Brown R, produces a brown, while the same dyestuff with acetate of alluminum produces a brown which is faster to washing and light. Colestin Blue B gives, with the acetate of chrome, a beautiful blue violet, while it produces a blue very fast to washing with a tannate of alluminum as a mordant. Other dyestuffs produce various shades with the different mordants.

Alizarine Bordeaux B D produces a Bordeaux Red, fast to washing and light, by the use of a salt of alluminum and lime as a mordant, while this dye gives a violet fast to light and washing if the chromates are used. Alizarine Orange gives a bright orange with the salts of alluminum and lime as a mordant, while

it gives a yellowish brown on a chrome mordant. Alizarine Red gives a red or rose shade with the salts of alluminum, lime and zinc, while it produces a brown with the acetate of chrome and a violet with the acetate of iron.

The mordants are used mostly in the form of acetates, as acetate of chrome, lime, nickel, alluminum, magnesia, etc. Sometimes, however, they are used in the form of rhodanate, tartrate, oxalate, nitrate and bisulphite. It is necessary for the dyer to find out by actual experiment what mordant produces the best results with any particular dye. Sometimes the various mordants are combined, as, for instance, acetate of chrome may be used in combination with nitrate of lime. Many of the mordant dyes give better results if printed on goods that have been prepared with Turkey red oil; among these may be mentioned Alizarine Rosa. Others, again, work better on goods that have not been prepared with the Turkey red oil, as Alizarine Blue S, Alizarine Bordeaux B D. Some dyestuffs, and particularly the bisulphite combinations of Alizarine Blue S or Coeruleins, can be advantageously treated with a short steaming in the Mather & Platt kier. Other dyes require prolonged steaming, such as Alizarine Bordeaux B D.

The mordant dyes can all be printed by having the necessary mordants mixed with the dyes. For instance, Alizarine-viridin F F, Anthracene Brown, Chrome Red, Alizarine Blue S, Chrome Orange, Alizarine Red S X Extra, Alizarine Blue Black B and 3 B, all work well with acetate of chrome. Sometimes the mordant dyes are mixed with ammonia. The following dyes can be used with the aluminum mordants: Alizarine Cyanine R, Alizarine Bordeaux B D and G D, Alizarine Heliotrope R and B B, and Alizarine Red X D. Very beautiful effects can be produced by extracting the colors produced by the above dyes, by a process of oxidation.

Another method is the following: The cotton goods are saturated with an alkaline solution of acetate of chrome. Then the pattern is printed on the goods with citrates, and the goods are then colored with mordant dyes. The part of the goods saturated with the citrates does not take the dye, and so white effects are produced on a colored ground. The following dyes can be used for this method: Yellow Cyanine, Alizarine Orange, Diamant Orange, Brilliant Alizarine Blue S D, Chrome Bordeaux 6 B, Anthracene Brown, Brilliant Alizarine Blue G, and Alizarine Blue Black B.

Many of the mordant dyes are used on goods that have been treated with alumina mordants, and which have had the white pattern impregnated with the citrates. Among such dyes may be mentioned Alizarine Red, which gives very good results. Other mordant dyes work well with the alumina mordants, and the pattern is afterwards produced by oxidizing agents. By this process, Alizarine Cyanine R, Colestin Blue B, Anthracene Brown, and Alizarine Bordeaux give good results.

The basic dyestuffs can be used in combination with the mordant dyes on chrome, alumina and iron mordants, in order to increase the brightness of the shade. Thus, Alizarine Red can be used with Rhodamine on alumina mordant; Alizarine-Viridin with Brilliant Green on a chrome mordant; and, Alizarine Lilac with Methyl Violet on an iron mordant.

In former years, the mordant dyes were employed much more extensively, by first printing the pattern on the goods with alumina or iron mordants, or a mixture of the two, and then bringing out the design by coloring with the mordant dyes.

At the present time, the simple steaming process is employed, whereby the goods are more thoroughly impregnated, even though thousands of pieces be under treatment at one time.

The employment of the mordant dyes for printing cotton goods manufactured by Fredk. Bayer & Company, Elberfeld, shows a rapid growth as

well as for the printing of one-half wool, silk, one-half silk, linen and one-half linen.—Leipziger Farber-Zeitung.

New Method of Fabric Printing.

Heretofore, the methods of fixing the impressions on silk or silk mixtures consisted of two distinct operations—steaming and washing. A new French method permits of both of these operations being conducted at one time. This is made possible by the use of a new mordant, which has the property of neutralizing certain coloring matters instantly, at the ordinary temperature. The method is as follows: The coloring is first done with such dyes as malachite green, acid fuchsine, the coralines, etc. The goods are then printed with sulphite of ammonia. The other sulphites, such as sulphite of soda, potash, zinc, or hydrosulphites, can be used, but the sulphite of ammonia is preferable, as it is more volatile. The sulphite destroys the color by simply exposing the goods to the air, and the white part of the goods can then be colored any desired shade.

White Designs on Colored Grounds.

For some time, fancy white figures on colored grounds have been very popular and are especially attractive when produced on mercerized cotton fabrics. One of the best methods of producing these effects consists in the use of basic colors, such as Methylene Violet, New Methylene Blue, Brilliant Green L'Auramine, etc. The mordant employed should be one that can be neutralized or removed by means of caustic soda.

The method of procedure is as follows: The goods should be thoroughly clean, before being treated. The fabric is then treated with a bath composed of 20 lbs. of tannic acid to each 4 quarts of water. The temperature should be from 60 to 70 degrees C., and it is necessary that the mixture should be applied uniformly to the goods, in order that the color produced may be uniform. After being treated with this mixture, the goods are passed through a calender press, and then dried thoroughly.

The goods are next treated to a bath of 11 lbs. tartar emetic, and 1 lb. chloride of ammonium, in 90 gallons of water, in order to fix the tannic acid. The cloth is next pressed and dried a second time. The fabric is then printed with a discharge paste composed of the following ingredients: 1 lb. starch, 3¼ lbs. English gum, 28 lbs. caustic soda, 12 Deg. If the character of the engraving on the cylinder requires that this mixture be reduced, it can be done by the addition of 3¼ lbs. English gum and 2¾ quarts of water.

After the goods have been printed, they are steamed for one to two minutes, then passed through a 2 Deg. bath of sulphuric acid, and washed. The goods are then ready for the dyeing, which is done in the method usually employed with the basic dyes, although some dyers think that the addition of a small quantity of tartar emetic, sulphate of allumina, or gelatine, increases the purity of the white.

In dyeing, the goods should be entered in cold liquor, which is brought slowly to a boil. When the bath has become exhausted, the goods should be removed, washed, and soaped, in order to brighten the colors. They are then washed and dried.—Moniteur de la Teinture.

—A process recently patented, and which, it is claimed, greatly increases the lustre imparted by mercerization, consists of wetting the already mercerized goods under tension, and drying them in this condition. The inventor claims that this additional process adds much to the lustre even after the mercerized goods have been bleached, colored or printed.

—Do not be too particular in the choice of your friends, under the penalty of having none.—Diderot.

Stripping the Color from Textiles.

Leopold Cassella & Co., Frankfort, whose agents in the U. S. are W. J. Matheson & Co., have patented in Germany a process for stripping dyed fabrics. The patent specifications state that the methods heretofore employed for stripping colors from fabrics, involve the use of as much hydrochloric, sulphuric, or other acid as could be used without destruction of the fibre. Carbonic acid and alkalies have also been used in as strong solutions as the wool fibre would stand. By these methods, the fibre is seriously injured, while many of the colors resist the action of these solutions. Spirit of nitre, or a mixture of it, with hydrochloric or sulphuric acid, has been employed, but this did not answer the purpose, because, while it stripped the dyestuff from the thread, it left the fibre of a yellowish color, and made it impossible to color the material again with colors that were complimentary to this yellow, such, for instance, as violet or blue.

Hot alkali solutions are particularly injurious, especially to the animal fibres, as they destroy more or less of the natural structure of the fibres which become matted or felted together. This shrinking is very objectionable for dress goods. The vegetable fibres become rough and woolly by being treated with alkalies, while acids impair their strength.

Dyers sought to avoid these difficulties by treating the material with Kaliumpermanganate, and afterwards with bisulphite of soda, or an alkaline solution of wasserstoffsuperoxyd. The use of both of these methods is restricted by the high price of the material, and their practical workings left much to be desired.

The patentee claims that he has found in hydrosulphite of soda a material which will destroy the most solid color without injuring the fibre, which can be recolored. He states that there is scarcely one artificial or natural dyestuff which can resist the action of this acid. The method is very simple. A solution of hydrosulphite of soda and cold or lukewarm water is prepared. The material to be stripped is allowed to stand in this solution until the color becomes bright enough to receive the new color. Generally, from two to four hours will be found sufficient to strip the color, although if necessary the material may be left to stand in the solution over night. Toward the end of the operation, the process may be facilitated by heating the bath. The tub should be well covered during the process. If the color has been sufficiently stripped, the material should be well washed in cold water, and is then ready for the new color.

The patentee claims a new process for stripping colors from textiles which have been dyed with artificial or natural dyestuffs, by the use of hydrosulphite, or its salts, in particular with acid hydrosulphite of soda. The advantage of this system, it is claimed, consists in the fact that the color is much brighter if the hydrosulphite is used, rather than sulphuric or other acids.

The objection to this process is the high price of the hydrosulphites. This hydrosulphite can be obtained from several sources, but either the price is very high, or it contains so much alkali that a large quantity of acid must be used in order to strip the colors fom wool. Since solutions of hydrosulphite cannot be kept for any great length of time, it is necessary for the dyer to prepare it himself, by mixing zinc dust and bisulphite and slowly stirring them together. Ten parts of bisulphite, 38 Deg. Be., is mixed with 12 parts of cold water, and one part of zinc dust is slowly added.

—The slave has but one master; the ambitious man has as many as there are others necessary to his success.—La Bruyere.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Length of Boilers.

Editor Textile World:

Your article on thicker boiler plates reaches us just in time, as we are about to order a new battery of boilers. We have read the article carefully, but notice that no reference is made to the length of the boilers. Can you give us any information on this point?

Huntington & Co. (73).

The article in question treated of the thickness of boiler plates and the ability of plates of various thicknesses to withstand the heat of the furnace, without injury. Consequently, no reference to the length of boilers was called for. The Mutual Boiler Insurance Company, of Boston, do not recommend a boiler over 18 feet long. Three-inch tubes are generally used, and tubes of this diameter, if over 18 feet in length, are apt to be unsafe.

Cost of Manufacturing Woolen and Worsted Yarn.

Editor Textile World:

Can you tell me where I can procure a table showing the wages paid and the number and class of employees in the various kinds of wool and worsted spinning, that is, of course, to either a set of cards or to a given quantity of wool or yarn. We are not spinners, but I wish to get some information that will help me to find percentage cost of labor and general expenses on yarn production.

Worsted (73).

There is no table published showing the wages paid and the number and class of employees in the various woolen and worsted spinning mills, but you will find in the January and February, 1900, issues of the Textile World, articles on the calculation of cost of woolen and worsted goods. They were accompanied by tables showing not only a method of estimating cost, but the statistics of a woolen mill, showing the cost of each department, as well as the general expense account. These figures are based upon actual results covering a series of years, in one of the leading woolen mills in this country, and they will give you a very fair idea of the cost of labor and general expense of manufacturing woolen cloth. The general expense account is larger than it would be in a mill making yarn only, as the mill in which these statistics were compiled was manufacturing cloth from the raw material.

The labor cost of manufacturing 3/8 blood worsted yarn, spun to about No. 32 is as follows. The estimate is based upon about 5,000 pounds of yarn.

Sorting, 10,618 lbs., at 64c. per C.	$67.96
Scouring and Drying, 10,000 lbs., Grease Weight, at $1.50 per M...	15.00
Carding and combing, 5,655 lbs., Top, at $1.30 per C.	73.52
Drawing, 5,372 lbs., Roving, at $1.75 per C.	94.01
Spinning, 5,372 lbs., Roving, at $2.00 per C.	107.44
Twisting, 5,090 lbs., Yarn, at $2.50 per C.	127.25
Spooling, 5,090 lbs., Yarn, $1.75 per C.	89.08
	$574.26

Warp, 5,090 lbs., at 11.28 cents per lb.
Extra for winding filling at .6c. per lb.
Total labor, at 11.88 cents per lb.

The above includes only the labor cost for the various processes. The general expense varies very much in different mills, and we should say that three cents per pound would be ample to cover the expenses outside of those given in the table above. This would make the cost of manufacturing 2/32s worsted yarn 14.88 cents per pound.

Fringe Machine.

Editor Textile World:

Will you kindly send me the name of

some firm that makes a machine for twisting the fringes of shawls?

Shawl (67).

We have answered our correspondent by mail, giving the address of one concern, and if there are any others, would be glad to know of them.

Cost of Mill Construction.

Editor Textile World:

Please inform me what would be a fair estimate for the cost of a mill building per square foot of floor space.

Enterprise (68).

The cost of mill construction per square foot varies with width of the mill, as the narrower the building, the greater the cost of the walls in proportion to the floor space secured. At the present time, in New England, 70 cents per square foot of available floor space would be a conservative estimate.

Finishing Woolen Hosiery.

Editor Textile World:

I would like information in regard to the finishing of woolen hosiery.

Wunchen (65).

Woolen hosiery should first be scoured by the dyer, before coloring, so that all of the grease may be removed for if any grease remains in the fabric it will show itself sooner or later after the goods are finished, and will soil bands and boxes, and hurt the sale of the goods. After being colored the goods should be carried immediately to the board room, and not allowed to remain in the baskets two or three days, as often happens when the boss finisher does not look well after them. After reaching the board or dry room, they should be immediately drawn on to the boards to shape them, and in doing so the boarders should see to it that they are carefully drawn to the board, so that every part of the stocking may fit the board perfectly. If this care is not exercised, the goods will be apt to be baggy at the toe, and the heel will be uneven, and if rib hose, great care must be taken to have the ribs boarded straight, or they will look badly. After being boarded and dried in the hot dryer, they should be taken from the boards and, if they are plain hose, should be pressed either between press papers, or in a steam press. A steam press gives the best finish as a general thing. After coming from the first boards, and before pressing, they should be put on hard wood boards, and placed in a steam box for a few moments until they are dampened a little, then pressed lightly in the steam press; this will give them a fine glossy look, but great care must be taken not to press them too much; if you do, it will give them a glazed or shiny look. Some finishers press the goods when they first come from the hot box, and then steam and repress them, but as a general thing once pressing is sufficient to make them look well. If they should be ribbed hose, the press should be adjusted so that the feet only should receive the weight of the press, and the whole length of the leg of the stocking should not be allowed to come under the press, the leg lying free from pressure, while the foot is being pressed. The dampness in the fabric coming from the steam box, will cause the ribs to swell as they receive the heat from the press, while the foot is being pressed, and will bring them up so they will look plump and bright. The operator will soon learn by the looks of the goods how long to let them remain in the press. All stock will not press alike, and no certain time can be fixed upon to leave the goods in the press. Good judgment must be used, and the goods removed as soon as pressed enough to look bright and glossy and the rib well brought up.

After the goods have been thus operated on, they should be taken to the finishing room, and there kept free from dust, and flying lint, by being carefully covered by a white cloth until such time as they are given to the finish menders to mend. Great care and good judgment is required to mend neatly, sort and mate the toes and heels, and lengths of the legs to a nicety. Unless the heels and toes are well mated, and the legs are also of the same length in pairs, the goods are not well finished, and the mill will be the looser. Under no circumstances should badly mended goods go as first quality, only one length should be in the same bundle. The goods should be put up in dozen, or if nice goods, in half dozen boxes, with a neat band around the first two pairs on the top of the box. The cases made should be so that the boxes will pack snug in the case, for if they shake, while in transportation, the boxes will be apt to break.

Analysis of Hosiery.

Editor Textile World:

We would like to know the composition of the yarn from which enclosed stockings are made, where we can buy the yarn, and also the best method of finishing the goods.

Mixture (74).

The two samples are different shades of

the same goods. The stock is all cotton; one sample being a mixture of white and yellow brown, the other a mixture of white and red brown. The size of the yarn is No. 5¼ single cotton standard, equal to 2¾ runs, or 39 7/10 grams for 25 yards of yarn. The yarn was carded and spun by the woolen system. When ordering these yarns send the spinner a sample of each color by which to match the mixtures which is done by making small trial batches of different proportions of each color until right shade is obtained. We have given by mail the addresses of several spinners who can furnish this yarn. On page 120, January, 1901, issue of Textile World, will be found general directions for finishing cotton hosiery, and which are applicable to these goods.

German Cotton Comber.

Editor Textile World:

Can you give me any information in regard to a new German comber, which, I believe, is in operation in a New Bedford mill?

Deutschland (66).

Our correspondent will be able to obtain information in regard to the new cotton combing machine (The Montfort Comber) from the American agents, Schwartz & McKerrow, 31 State Street, Boston, Mass. There is one in operation at the Winthrop Mills, Taunton.

Flax Fibre For Export.

Editor Textile World:

We should like the addresses of flax growers in Canada and the United States. We want to buy raw flax fibre put up in jute packing, for export.

Raw Flax (77).

We have replied to this inquiry by mail, and will forward the address of any who may desire to communicate with this buyer.

Equipment of a Silk Dyehouse.

Editor Textile World:

We would like information in regard to the equipment of a dyehouse for coloring 10,000 pounds of silk yarn in the skein per month.

Broad Silk (83).

We refer our correspondent to the series of articles, the first one of which appears in this issue, on the subject referred to. We have secured these articles in response to this inquiry, believing it to be of general interest, and trust they will give the desired information.

Burling Cotton Goods.

Editor Textile World:

What is the best way to burl cotton goods, such as denims? We are employing a very slow process indeed, as we have a man turning the wooden roll with one hand, and picking off the loose threads, etc., with the other.

Cold Molasses (79).

The best way to burl cotton goods of the class mentioned is not to burl them at all. The method usually adopted by mills where any burling is to be done, is to take the roll of cloth as it comes from the looms, run the same over a burling desk or table and roll the piece up again, as it is buried in the same manner as it came from the looms.

The burling desk or machine should be run by power, and started or stopped instantly by a slight pressure of the foot on the treadle. When handled in this manner both hands of the operator are left free to pick off the strings, or to pick out the lumps, etc. A far better way to handle a denim or any of the common class of cotton goods, is to take the pieces just as they come from the loom, sew and roll the same on rolls as large as can be comfortably handled. Have all seams sewed on the back or wrong side of the pieces. Then take the rolls direct from the sewing machine to the shearing machine, and run the goods face down on the shear. A machine having three shears for the face and two shears for back of the goods, is recommended. A single sewing machine and shear of this class is capable of running from four to five hundred pieces of goods a day at small expense, and will be found a great improvement over hand burling and trimming of the goods.

Cost of Foreign Patents.

Editor Textile World:

Please inform me what it will cost to secure a copy of a foreign patent.

Capitol (69).

There are but few countries where printed specifications can be procured. A copy of an English patent, containing drawing and description, will cost about twenty-five cents. German patents can be procured for 50 or 65 cents each. It would be necessary in other countries, to order manuscript or typewritten copies at the current rates. A copy of a French patent, which was recently ordered, cost $15 for the specification and drawing.

Hosiery Steam Box.

Editor Textile World:

I would like directions for making a steam box for steaming hosiery.

Steamer (84).

A good, serviceable box for steaming hosiery can be made in an oblong shape, out of plank eight inches wide and 2½ or 3 inches thick, tongued and grooved, and bolted firmly with ¾ inch iron rods. These bolts project four or five inches above the end, which is counter-sunk in the wood, and holes are bored in the cover to correspond with these bolts. A coarse thread is cut on the end of the bolts, by means of which the cover is fastened down firmly on the box, with thumb screws or nuts. Shelves or trays, made of brass wire, or galvanized netting, answer very well to support the goods in the steam box. The steam should enter the box more in the form of a spray than a jet of steam; that is to say, it should be distributed as much as possible, so as to prevent its affecting one part of the goods more that the other. There should be no iron exposed to the action of the steam. Any exposed metal should be either copper or brass. Wooden lugs, fastened with brass screws can be used for supporting the trays or shelves.

Handling 3 3-4 Run Single Yarn for Knitting.

Editor Textile World:

I intend to use 3¾ run single black yarn in my hosiery mill. I have heretofore bought wool yarn in the skeins, and then dyed and scoured it myself, but single yarn of this size is very tender and apt to felt badly in dyeing and scouring. How would you advise me to proceed? I have no dyeing machines, and color in the open tub.

Seventh Day (82).

We would not advise our correspondent to attempt the coloring of this single woolen yarn in the skein. Better results can be obtained either by having it colored in the raw stock or by piece dyeing, as it is very difficult to prevent tangling and felting such yarn in the skein, unless colored in one of the modern skein dyeing machines. We think that our correspondent will find it best to dye this yarn on the cops and have it coned for his knitting machine.

Waste in Combing Cotton.

Editor Textile World:

Please give me information in regard to the amount of waste made on a cotton comber. I am in charge of combing, and the waste amounts to about 18 per cent. of the quantity of stock delivered to the combs, and I would like to reduce it to 15 per cent.

Waste (71).

It is impossible to answer this question without knowing the kind of stock used and the condition in which the material reaches the comb. We have secured opinions from a number of practical overseers on this point, and published them in the Cotton Department of this issue.

New Publications.

The Worsted Overlooker's Handbook. By M. M. Buckley. Price 50 cents. This is a handy little book of 72 pages, treating of the calculations and rules for use in the manufacture of worsted yarn. It includes useful tables relating to the same subject.

Agenda Des Soies et Soieries. A Rey et Cie. Lyon, France. Price $2.50. This is a directory of the French silk industry. The first part is devoted to the raw material, and includes the various industrial associations, dealers in the raw material, and bankers who make advances on stock in warehouses. A list of silk brokers follows, and then come the manufacturers and merchants of sewing and embroidery silk. Then follow in the order named, silk throwsters, carders, combers and spinners of silk waste, artificial silk and ramie; builders of tools and machines for the silk industry.

The second part is devoted to the goods industry, beginning with a list of the silk associations, followed by a directory of brokers and commission houses, dyers, printers, finishers, and establishments producing moire effects on yarns and cloth, either in silk or mixed goods. Then follow the builders of tools and machinery for this branch of the industry.

The third, and last part of the work is devoted to the commercial houses trading in silk goods, ribbons, passementeries, laces, etc. It includes both wholesale and retail dealers. In addition to the directory proper, there is an alphabetical index of all firms whose names appear in the work. The directory is classified by the departments in France, and will prove to be a very valuable book to parties interested in the French silk industry. Orders may be sent to the Textile World.

Change Tables for Denn Warp Machine. Price $1, postpaid. This is a book of 62 pages, containing tables printed in bold type; the first column represents the length of cuts in yards, and opposite each length is given the change gears to be used. Every change of one yard is printed in heavy face type. In addition to the table, which occupies the bulk of the book, there are given useful rules for finding the weight of warp. The table gives gears for 1037 changes, ranging from 37 to 150 yards. Orders may be sent to the Textile World.

Cone Drawing. By M. M. Buckley. 48 pages; illustrated; 50 cents. This little book gives a very clear explanation of the principles and mechanism of worsted cone drawing, and will be welcomed on account of the lack of familiarity of many of our worsted drawers and spinners with this system.

L'Art De Decorer Les Tissus. Compiled from the collections at the Historical Museum of the Chamber of Commerce of Lyons, France. By Raymond Cox. 127 illustrations. Price 500 francs in Lyons. This work has been compiled in order to place before manufacturers reproductions of the expensive fabrics collected at Lyons by the Chamber of Commerce. The Journal des Debats says: "L'Art de Decorer les Tissus is a collection of engravings reproduced some in colors, some by photographic methods, in black or in bistre, and comprising the most characteristic fabric selected with great discrimination from the 300,000 samples in the Museum at Lyons. The author has divided the work into four great epochs or periods, during which different schools of art have prevailed, taking up first the Byzantine period, then the Arabian, the Italian, and French. The Byzantine period extends to the seventh century, the Arabian to the twelfth, the Italian to the sixteenth when the French period begins and comes down to date. The book is a chef-d'oeuvre. The Lyons Chamber of Commerce has rendered all possible aid to the author." The lead in the production of fancy silk fabrics which Lyons has maintained for so long a time, is due in no small degree to the enterprise which has brought together in that city a collection of fabrics representing the art of textile decoration from the earliest times, and the object of the author in compiling this collection is to place these valuable designs within the reach of manufacturers throughout the world.

Spooling Machinery. Easton & Burnham Machine Company, Pawtucket, R. I. This is a new catalogue of 26 pages, describing and illustrating the spooling, winding and doubling machinery manufactured by this well known firm. It includes descriptions of bobbin spoolers with and without the Easton & Burnham bobbin holders, doubling spoolers, bobbin holders, yarn guide, traverse motion, and Fall River separator.

Cotton Diagram. Turner, Routledge & Company, Liverpool, England. This is a graphic chart showing the fluctuations in the quotations for various grades of cotton at Liverpool for the past five years. The fluctuations are recorded by weeks, which makes it a very close guide, and in addition to the graphic chart, there is given bank rate table showing the lowest, highest, and average prices for twelve years, statistics of import, export, consumption, and stocks in sight, for five years. The value of graphic diagrams showing fluctuations of most anything and everything is being recognized more and more every year, and the publishers of this diagram deserve credit for the manner in which they have compiled it.

Cole's Encyclopedia of Dry Goods. By George S. Cole. This is a new edition, revised and enlarged, of the well known work which has been found so useful by the trade. It contains many important additions in the shape of new matter and illustrations.

Address of D. M. Thompson, President of the N. E. Cotton Manufacturers' Association. At the request of many who wanted copies of President Thompson's address delivered at the recent meeting of the N. E. Cotton Manufacturers' Association at Washington, it has been published in pamphlet form, together with the addresses of Secretary of the Treasury Gage, Secretary of the Navy Long, P. M. General Smith, Secretary of Agriculture Wilson, and Rear Admiral George W. Melville, Engineer in Chief of the U. S. Navy, made on the same occasion. This pamphlet puts the address of President Thompson in convenient form for reference. The addresses were delivered at the time of the presidential campaign, in which issues of vital importance not only to the textile industry, but to all business interests, were involved, and all who heard the address of President Thompson will recall the clear and forcible arguments which he brought to bear in defence of sound money and protection to American industries. These addresses are well worth perusal, even now, after the issues have been settled, and we advise each of our readers to secure a copy, if possible.

Personal Experiences. The American Correspondence School of Textiles, New Bedford, Mass. This is a pamphlet of 45 pages, containing letters from parties in various parts of the country, testifying to the good work which is being done by this correspondence school. The testimonials are very strong, both from students, and from those who have noticed the good effect the study has had upon employees in the mill.

Transactions of the New England Cotton Manufacturers' Association, 69th annual meeting. This annual publication has reached us, and contains the proceedings at the meeting held last October in Washington, and the papers read at that time. This publication is too well known to require extended notice, as it is a regular feature of the well-known association that issues it.

A, B, C System of Mechanical Draft. Catalogue No. 118. American Blower Company, Detroit, Mich. This is a very attractive catalogue, of 59 pages containing unusually fine illustrations of the various methods of mechanical draft employed by the American Blower Company. Many useful tables are added, giving the properties of saturated steam at various pressures, volume and density of air, weights of steel, cost of coal for steam power, horse power transmitted by belts, etc.

Engines and Boilers. Fraser & Chalmers, Chicago and London. New catalogue of 128 pages, in which the engines and boilers built by this well-known firm are described and illustrated, and many valuable tables included.

Practical Economy. The Clark Brothers Company, Vicksburg, Mich. This is an attractive booklet of 24 pages, containing much information on the economy in steam production, effected by car-

ing for the boilers, proper firing, and the use of the apparatus manufactured by the Clark Brothers Company.

The Angora Goat. United States Department of Agriculture. This is an illustrated pamphlet of 83 pages, giving information in regard to the Angora Goat. The illustrations are unusually fine, and much valuable information has been included in the work.

Experiences of a Ranch Wool Grower. By Francis E. Warren. This is the address delivered by Senator Warren, of Wyoming, at the recent meeting of the National Association of Wool Manufacturers, in New York.

Induced Mechanical Draft. Buffalo Forge Company, Buffalo, N. Y. This company has published four folders, illustrating in a general way their mechanical induced forced draft, down draft, and high speed engines. They display, by half-tone engravings some of the types of their apparatus. The illustrations are accompanied by reading matter, concisely setting forth the features of the machine.

New Color Cards Recently Received.

Vigoreux Printing. William J. Matheson & Co., Ltd., New York. This card contains 30 samples of worsted dress goods, made from stock printed in the slubbing. This system produces very attractive mixed effects. Full particulars and formulas are given.

Printing With Irisamine G. Wm. J. Matheson & Co., Ltd., New York, N. Y. This card shows two samples, one printed with Irisamine G, fixed with tannin, and the other printed with the same dye, but fixed with acetate of chrome. A comparison of the two shows that this new product works well with chromic salts.

Industrial News.

—The Willimantic Linen Company have given H. G. Brinckerhoff, the New England Agent of the Green Fuel Economizer Company, a repeat order for his well-known machine.

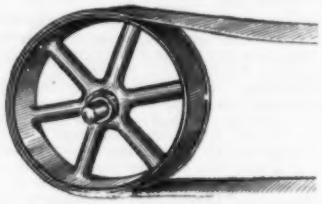
—Aluminum Soldering can be accomplished according to English patent 18731/97, by warming to a low, red heat and then plunging into a bath of salt and turpentine. Allow to cool in this bath, then sprinkle on borax and aluminum can be soldered to the material.

New Burr Picker.

A wool burring machine has been patented by Jules Morel, Roubaix, France, which, it is stated, is a great improvement over former methods, the burrs being removed more thoroughly, while the staple of the wool is preserved.

The Acme Pulley Cover.

In order to obtain the best results in the transmission of power by belts, it is necessary that the surface of the pulley should be as near the nature of the belt as possible. The Acme Pulley Covering Company, 1 West 103rd Street, New York, N. Y., claim that the Acme pulley cover manufactured by them attains this desired object. They state that the results from the use of their cover warrant them in claiming that it prolongs the life and maintains the elasticity of the belt,



and prevents the great losses resulting from slipping or tight belts. They state that by the use of this cover the pulley can be easily crowned as desired, and in this way the belt made to run in the centre of the face. The manufacturers will be pleased to send to anyone interested full information in regard to the use of this cover, and also a trial order by express, prepaid, with the privilege of returning at their expense if not found satisfactory, and with no charge made for the portion used.

Lee's College.

The desire to learn is as essential in acquiring an education as the facilities for learning. This is demonstrated by the many remarkable examples of eminent men who have by perseverance and determination to acquire knowledge become eminent in many departments of human knowledge, in spite of the fact that no college doors were open to them. Scattered throughout our textile mills are a great many ambitious, intelligent men, who desire to perfect themselves in textile manufacturing, and who are struggling to acquire knowledge by observation and by the reading of what few books they can get hold of. It is to assist such students that the correspondence schools have been organized. These schools have the great advantage of having among their students a large majority who are thoroughly in earnest. Lee's College, Charlotte, N. C., gives a textile course by mail. The price is moderate, and within the reach of mill workers.

Manufacturers' Agent

Thomas H. Doane, 233-235 Monroe Street, Chicago, Ill., is selling agent for textile manufacturers, and has superior facilities for marketing the product of woolen, cotton and knitting mills. He has ample facilities for storage, and is prepared to give references and a bond, if necessary for the fulfilment of all contracts made with him.

—The American Bridge Company announce their sales during January, as the largest of any month since the organization, aggregating over sixty thousand tons.

Bleaching Process.

Continuous bleaching is suggested by Hadfield of Stockport, and the method of operation consists in passing the cotton through muriatic acid of 1.4 Beaume, and allowing to stand for some hours; then rinse and wring and pass through six baths of caustic soda, boiling, 1.½ Beaume; rinse again and pass into chemic, and thence into a box filled with steam and vapors of acetic acid. Soluble acetate of lime is thus formed and chlorine set free.

Selling Agents.

M. Wagner & Company, 213 Ninth Street, Pittsburgh, Penn., are selling agents for hosiery and underwear mills, and solicit correspondence with manufacturers desiring to reach the jobbing trade. They are experienced in this branch of business and prepared to furnish any mills desiring selling agents with satisfactory references as to their reliability and facilities for handling the product.

Southern Import and Commission Company.

This firm, whose headquarters are at Greensboro, N. C., wish to call the attention of hosiery, underwear, carpet and yarn mills to their facilities for marketing goods. The selling of goods is as essential as manufacturing them, and this company are confident that they can handle the product of mills in their line in such a way as to avoid many of the difficulties and losses which have in the past accompanied the marketing of textiles through the regular channels.

Enlargement of Plant.

The American Blower Company, of Detroit, Mich., manufacturers of Hot Blast Heaters, Fans, Blowers, Engines, Dry Kilns, etc., expect to begin operations in the early spring upon extensive additions to their present plant. The plans contemplate a very large addition to the Steel Plate Fan Erecting Shop. This will be of steel construction throughout. A new Blacksmith Shop, Storage Warehouse and Power House will be erected. The Power House will be equipped with new boilers, engines, dynamos, mechanical draft apparatus, etc., all of the latest design. The entire plant will be remodeled, rearranged and equipped throughout with new cranes, hoists, etc. A commodious and well appointed wash room and locker will be provided for the men. When the improvements are completed, the plant will be one of the best equipped of its kind in the country.

Autogene Black.

Messrs. Sykes & Street, 35 Water St., New York, with branches at Boston and Philadelphia, are bringing out a new direct dyeing sulphur black for cotton under the above name, which is fast to light, air, alkali, acid and strong soaping, and requires no fixing with metallic salts nor atmospheric ageing. This ought to be a useful dyestuff, and we shall show samples of it in an early issue of our Dyers' Supplement.

Southern Cotton Mill For Sale.

Attention is called to the advertisement in this issue of the Textile World, of a cotton mill at Starkville, Miss., which can be purchased on favorable terms. The plant has water power, and is now in operation. The owner states that other business interests induce him to offer the mill for sale. Full particulars can be obtained by application to Capt. J. A. Wiggs, Starkville, Miss.

The Lowell Textile School.

At the annual meeting of the Trustees, which was held on Jan. 29th, the following officers were elected for the ensuing year: President, A. G. Cumnock; Vice-President, A. S. Covel; Clerk, J. T. Smith; Treasurer, A. G. Pollard. Resolutions in memory of the late Governor Roger Wolcott were adopted. Governor Wolcott was an Honorary Trustee, and a strong supporter of the school.

Graphite.

Graphite differs widely in appearance and physical makeup. Some is crystallized, and some is amorphous; some is hard, and some is soft; and there are many other differences. The best results from the use of graphite must be obtained only when the proper quality is selected and prepared. The Dixon Company, who are miners, importers and manufacturers of graphite, have, during their experience, obtained a very wide knowledge of the material, and this enables them to select one kind of graphite for lead pencils, another kind for lubricants, and to make various selections and mixtures for the different products manufactured by them.

Bleaching Wool With Manganate.

The well scoured wool is steeped in a solution containing 4 per cent. of manganate of potash and 1 to 1½ per cent. of magnesium sulphate. The latter is necessary, says the Dyer and Calico Printer, to prevent the potash from injuring the fabric. After about 15 minutes the wool is removed to dilute sulphuric acid or solution of sulphate of soda or alumina, to dissolve the precipitated magnesia from the fibre. Sulphuric acid is used at a temperature of 20 to 30 deg. C. Finally, wash with soap and a little ammonia. This process works, it will be found, both thoroughly and quickly.

—H. G. McKerrow & Company report the following orders recently received: Norris Cotton Mills, Cateechee, S. C., card room machinery; Smithfield Cotton Mills, Smithfield, N. C., cotton machinery, the slubbing, intermediate and roving frames being of Tweedales & Smalley make, for whom H. G. McKerrow & Company are American agents; American Thread Company, Tweedales & Smalley cards.

—The American Bridge Company have received the contract from the Pittsburg & Lake Erie Railroad for the new steel bridge over the Monongahela River at Homestead, Pa.

Rapid Turkey Red Dyeing.

A process has been devised with the object of dispensing with the long soaping required in this process. The goods are passed through a 25 per cent. ammoniacal bath of Turkey-red oil, dried, steamed, then passed through a neutral alum bath and again dried. The goods then pass direct to the dyebath which contains, for every 100 yards of stuff, 4 lbs. of alizarine, 4 lbs. of acetate of lime of 28 deg. Tw., 1 lb. of Turkey-red oil and 8 lbs. of metastannic acid. This last is a very important factor, says the Dyer and Calico Printer, and is obtained by precipitating a solution of tin in nitric acid with soda. Another and very different process is said to answer equally well: the goods, having been mordanted with a mixture of the acetates of alumina, lime and magnesia, have a bath of water glass containing some ammonia. It is then rinsed, dried and padded with a mixture of alizarine, mucilage, caustic soda, Turkey-red oil and phosphate of soda. This is then steamed for from 2 to 2½ hours, soaped and soured.

New German Combers for Short Staples.

The new German combers which have been installed by Messrs. Schwartz & McKerrow at the Winthrop Cotton Yarn Co. in Taunton are now in operation and doing satisfactory work. These machines exhibit a very high degree of workmanship. They are capable of turning off from 650 to 750 pounds weekly, and have, we understand, been known to comb as short as ⅞-inch staple with the best results. There has been a very widespread interest in these machines among mill men both North and South and a number of them propose to visit the Winthrop Cotton Yarn Co. to inspect the combers.

Messrs. Schwartz & McKerrow, the American agents for these machines, are located at 31 State Street, Boston.

Bar Belt Dressing.

Argument is good, especially when based on facts, but what is still better than argument, is an actual trial of Stephenson's Bar Belt Dressing. The Stephenson Manufacturing Company, Albany, N. Y., will send a free sample upon request from anyone interested.

—The Burt Mfg. Co. of Akron, Ohio, were recently favored by an order for two 150-gallon Cross Oil Filters to equip the new modern power house of the Havana Street Ry. Co., Havana, Cuba. As only the best, most modern machinery was selected, this is a strong endorsement in favor of their filter.

—The American Bridge Company has a contract for furnishing the steel work to the Bureau of Yards and Docks for Building No. 22 at the New York Naval Yard.

—Lorraine Manufacturing Co., Pawtucket, R. I., have placed an order with the Green Fuel Economizer Co. of Matteawan, N. Y., the sole makers in the United States of Green's Economizer.

Universal Winding Co.

Since the issuance of the decree by the U. S. Circuit Court confirming the validity of the Universal Winding Co.'s patents, new patents have been issued to this concern for valuable improvements and mechanical principles relating to their system of winding, which still improve a process which has been of great value to textile manufacturers.

The solidity of the yarn, when wound, has led some to think the process strained and stretched the thread. To test this, experiments were made in winding No. 160 soft twisted cotton yarn and also the finest silk yarn used in manufacturing. It was found that these tender and delicate threads were wound as easily and with as much freedom from breakage as were the stronger and coarser yarns, and unwound without trouble, proving that the solidity of the mass is secured without causing strain to the yarn. The Universal Winding Co.'s Boston office is located at 95 South St.

American Bridge Co.

The Allegheny Steel & Iron Company will erect a steel plant at Breckenridge, Pa. The contract for the building has been let to the American Bridge Company. This includes two producer sheds, a boiler house, a main building, an open hearth building and a crane run way. The main building will be 72 feet by 252 feet, with four lean-tos. The open hearth building will be 72x161 feet, with three lean-tos. About 500 tons of steel will be required.

Test for Positive and Negative Electricity.

It is frequently desirable to determine which is the negative, and which is the positive pole of an electric current. A German exchange recommends the following method: Unsized paper is soaked in a mixture of 1 or 2 parts Phenolphthalein, 10 parts alcohol and 110 parts distilled water. The paper, while still moist, is then immersed in a mixture of 20 gr. sulphate of soda and 100 c. c. distilled water. It is then dried by a gentle heat, and cut into strips and furnishes a sensitive test paper for distinguishing the opposite poles of the electric current. A strip of the test paper is moistened, and the two ends of the wire are laid on it from 5 mm. to 1 cm. apart. The electric current frees the alkali, and red spots or streaks appear near the negative pole.

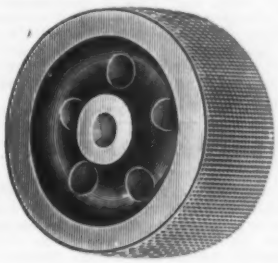
Preserving Wooden Tubs and Vats.

The following recipe for a preparation to prevent destruction of wooden dye vats from effects of dye liquor is given by the Textil-Zeitung: 2¼ lbs. shellac, 4½ ozs. resin, 4½ ozs. Venetian turpentine, are boiled together, and then six quarts of alcohol are added. This mixture is applied to the wood, which should be heated to 70° C., if the vat is to be used for hot liquors.

The Vacuum Cement and Pulley Cover.

Thousands of manufacturers using leather belts for the transmission of power, experience annoyance and trouble with slipping belts, from which arises many losses, such as time, power, etc.

Pliability of belt, and attendant quality to hug closely to the surface of pulley, are important factors in transmitting power by belting.



The Vacuum Cement & Pulley Covering Co., 1493 Third Avenue, New York, manufacture a pulley cover which, they state, allows the use of a much slacker belt than usual, this slackness of the belt preventing belt strains as well as strains on the machinery. The covering may be applied to any pulley, iron or wood, and is guaranteed for five years. The firm furnish the materials and state that any workman can easily apply the covering, doing this outside of working hours.

It is claimed that the Vacuum Cement and Pulley Covering will prevent all slipping of belts, being free from all harmful ingredients; and by adopting the methods recommended nothing comes in contact with the belt to injure same, and that the life of the belt is greatly increased.

They state that the efficiency and general excellency of the Vacuum Cement and Pulley Covering has been attained only through years of careful experiments and established records.

The following letter from a user of this cover, speaks for itself:—

Providence, R. I., Nov. 13, 1900.

The Vacuum Cement & Pulley Covering Co., New York City.

Gentlemen:—We have used your Pulley Covering for the last three years on our railway and speeder cones, also on special drives, and it is giving very good results, which is entirely satisfactory.

Yours very truly,

FLETCHER MFG. CO.,

Per A. J. Dronsfield, Asst. Supt.

The company refer to users of the Covering, among whom may be mentioned the following: Amsterdam Street R. R. Co., Amsterdam, N. Y.; Singer Mfg. Co., Elizabethport, N. J.; Whittle Dye Works, Providence, R. I.; National Switch & Signal Co., Easton, Pa.; Seebeck Bros., New York; Cranston Print Works, Cranston, R. I.; Chicago Brass Co., Chicago, Ill.

Belt Cement.

A German exchange gives the following recipe for a belt cement: Dissolve 50 parts of glycerine in water and remove the skum from the surface; this is then warmed in a water bath, and 5 parts of glycerine, 10 parts of turpentine and 5 parts of linseed oil varnish added. This mixture can be thinned by the addition of water. The ends of the belt to be cemented are cut diagonally, so as to form a good joint, the leather is warmed slightly, and then coated with warm cement. The ends are then brought together, and kept under heavy pressure for twenty-four hours, or until thoroughly dry, when the belt is ready for use.

The Idlers in the Air.

The Cling-Surface Mfg. Co. state it is a proven fact that Cling-Surface will allow the idler to be lifted from a belt, and yet permit the belt to carry full load without slipping, under strain of working load only, with half the belt hanging slack or easy, and transmitting more power than with the idler.

Aaron French, of Pittsburg, who has made donations to the French Textile School and Georgia School of Technology, has sent to the Massachusetts Institute of Technology his check for $2500.

Manufacture of Fabrics a jour.

A device has been patented in France for the production of fabrics containing perforations. These perforations are made by simply displacing the threads of warp or filling, which are fixed in the new positions during the operation. The holes are made in the cloth by means of needles pointed at one end, the upper or larger portion being of any desired shape, either rectangular, oval or circular. The point enters the cloth, and as the needle is pushed down, the threads are shoved to one side, making a hole in the fabric of the same shape as the needle.

The threads are fixed in the new position by two different methods. After the fabric has been punctured, the cloth is passed through a cylinder, the surface of which is corrugated, or has diamond points. These points are placed on the cylinder to correspond with the pattern made by the needles. The pressure of the hot cylinder fixes the threads in the position that the needles have left them. Another method of fixing the threads in position consists in placing a vessel filled with size underneath the cloth, while it is being perforated. The needles passing through the cloth dip into the size, and as they are withdrawn, the size which adheres to the needle is transferred to the cloth, and this fixes the threads in position.—L'Industrie Textile.

—The new power station for the Grand Rapids Company, at Grand Rapids Michigan, will be 111 feet wide and 147 feet long, furnished by the American Bridge Company.

Dyeing Raw Stock.

The dyers of raw stock throughout Germany and France, dispense to a large extent with "poling" of the material, by using tubs provided with rotary pumps which circulate the liquor through the stock. By an arrangement of valves the current can be directed from top to bottom or in the reverse direction.

Enlargement James Leffel & Company's Plant, Springfield, O.

Work is now progressing on new addition, 90 by 220 feet, to be built of brick and steel, and equipped with electrical cranes and a number of new machines to enable them to supply the increased demand for their celebrated Samson wheels. These works will now give work for 300 men. This celebrated company has just received an order for a large pair of horizontal wheels from Minneapolis, to develop 3000 H. P.; and another contract for ten 68-in. Samson wheels from Michigan, for driving electrical machinery.

Fabrics for the Tropics.

A fabric composed of linen and silk, forms the subject of a German patent. The inventor claims that the combination of linen and silk makes a material possessing the good qualities of both, and the bad qualities of neither. He states that the linen alone is objectionable on account of the chilly feeling it causes when touching the skin, while the all silk cloth causes just the opposite sensation, and gives rise to hot flashes when it covers the body. The advantages claimed for the combination fabric are: that it is a non-conductor of heat, and thus furnishes protection against the sun's rays; that any moisture in the fabric evaporates very rapidly, much quicker than in the case of woolen or cotton cloths, and consequently the danger of catching cold is greatly reduced; on account of the smoothness of the texture, the danger of absorbing disease germs is much less; the goods are easily washed, and not subject to the ravages of moths.

W. H. Willis has given a course of lectures at Kearney, Neb., to the employees of the Kearney Cotton Mill. The fourth one in the course was given on February 15th, in which Mr. Willis explained the methods of weaving circular bags and Turkish towels.

Peat as a Textile Fibre.

A German process for converting peat into a fibre suitable for manufacture into cloth, is described as follows:

The fresh peat is soaked in a 2 or 4 per cent. alkali solution to remove the earthy matters, and neutralise the earthy acids. The material is then dried and run through a picker. Then it is treated with a ½ to 1 per cent. sulphuric acid bath, which converts the starchy matter into dextrine, and removes the albumen. A large saving of fibre is effected by dissolving the malt in the peat by means of a sulphuric acid solution.

Alcohol is produced as a by-product by the addition of yeast to the dextrine. The material is then washed with water, dried, and then treated with benzine, ether or similar substance in closed kettles, to remove the resin and fatty matters. The tannic acid is removed by successive alkali and acid baths. The fibre is then bleached and dried. It is claimed that in spite of the apparent complexity of this process, the product is much cheaper than cotton, flax or jute, costing about 3½ cents per pound. The originator of this process claims that durable and attractive fabrics can be made from the peat fibre, and that it possesses sufficient strength and durability to serve for belting. The material absorbs but a small quantity of moisture, can be bleached a clear white, and colored bright shades, and it is said to be a non-conductor of heat.

Victor Knitting Machine.

R. M. Oates, of the Gold Crown Hosiery Mills, Charlotte, N. C., has taken the agency of the American Knitting Machine Co., and will have the Victor Machines on exhibition at his mills. Mr. Steer, the former Charlotte agent, is going north with the main office, which is now in Philadelphia instead of Woonsocket, R. I.

Artificial Coal in Germany.

U. S. Consul Frankenthal at Berne writes that in the Hemshof dye and soda factory, near Mannheim, Germany, is a workman named Montag, who, it is reported, has invented a substitute for coal which costs about 25 cents per 220 pounds to manufacture. Peat is the basis, with the addition of certain chemicals which, up to the present, are the secret of the inventor. Parties who have seen the product burn say that it gives a great heat, burns with a bright flame, and leaves no slag and only a small quantity of white ash. Certain Mannheim capitalists have tried to obtain the secret from the inventor by offering him a position as director in a company to be established, giving him a salary of $4000 and 2 per cent. of the net profits; but he has refused this offer, because he wants to control the sale of the invention himself. Capitalists now claim that Montag asks too high a price. Mr. Gehrig, the secretary of the Mannheim Chamber of Commerce, has, it is said, undertaken to procure the necessary means to commence the manufacture of the article in partnership with the inventor. They have bought 25 acres of peat land and have bonded 125 more in the vicinity of Hockenheim, where they will erect the necessary buildings, large enough to keep several hundred men at work. It is figured that the daily output will be 60 tons. It is said that the peat is thoroughly dried, ground by machine, mixed with the chemicals, and pressed into brick shape.

—The American Bridge Company will furnish to Cooper & Wigand, about 2800 tons of structural steel for the Kingsbridge Road Power House on the Third Avenue Railroad, New York City.

—The American Bridge Company are at present getting out about twenty bridges for the Erie R. R. Company.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Alexander City. Work is to be started at once on erection of the buildings for the Alexander City Cotton Mills. Building will be equipped at first with 10,000 spindles, but space will be provided for 10,000 additional ones, which will be installed later.

—*Alabama, Anniston. The Anniston Yarn Mill Co., capitalized at $100,000, with W. A. Scarborough president, J. T. Gardner treasurer, and C. Goodwin superintendent, informs us that they expect to be ready to start manufacturing hosiery yarns about April 15. Mill will have equipment of 5,000 spindles.

—*Alabama, Elba. We have been informed by A. J. Smith, regarding the proposed cotton mill here, that charter for a $200,000 mill has been secured, and that nearly all the stock has been paid in. As soon as contracts for building the power house and mill have been placed, then orders will be given for the necessary machinery. Mill will be run by water power.

—*Alabama, Leeds. We have been advised by J. B. Elliott that a proposition has been made by W. N. Malone and associates to locate a cotton mill here with capital stock of $50,000. It is thought that the project will be carried through.

—*Alabama, Sylacauga. The McDonald Cotton Mills will hereafter be known as the Central Mills. Company is now making test of the machinery, which they contemplate having in operation March 1st.

—Canada, Ontario, St. Henri. The Colonial Printing & Bleaching Co. will erect a cotton mill at Shawanigan Falls, above Three Rivers, for purpose of supplying cotton cloth necessary for their print works. Mill will have an equipment of about 1000 looms.

—*Connecticut, Meriden. Nearly all of the new machinery has been set up in the Independent Thread Company's mill. The company says it has plenty of orders on hand and as soon as the operatives are competent, that work will be steady.

—*Connecticut, Seymour. We have been informed by D. J. Walters, Bridgeport, manager of the new company which will manufacture laces, that they are now remodelling buildings for installation of some of the machinery lately received from abroad. They contemplate starting manufacture of goods about April 1st, employing about 70 people.

—*Georgia, Cedartown. The new mill to be erected at this place will be operated under name of the Adamson Mill Co., with Charles Adamson, president, and Franklin Baker, Jr., treasurer. They will manufacture a fine grade of hosiery yarns. Mill is to be equipped with 10,000 spindles, although but 4000 will be installed and put in operation at first. Site has been selected and plans and specifications will soon be ready to proceed with the structure. Most of the equipment has now been arranged for.

—*Georgia, Gainsville. The new mill to be erected here by John H. Montgomery and others, will be 125 by 300 feet, four stories high. Engine and boiler rooms will be built separately. Most of the equipment comes from the Vesta Mills, and will consist of about 25,000 spindles and 750 looms. The necessary amount of money has been subscribed to insure the mills being built.

—*Georgia, Moultrie. The machinery is being installed in the new plant of the Moultrie Cotton Mills, which expected to have had the plant running Jan. 1st, 1901. The mill is constructed so that capacity can easily be doubled. John Schofield will be superintendent.

—*Georgia, Villa Rica. The project of a cotton mill is again being agitated at this place. Professor Steed, H. W. Barron and I. C. Wade, the latter of the land and industrial department of the Southern Railway, are interested. It is proposed to erect a $100,000 plant. A committee has been appointed to solicit subscriptions toward the capital stock.

—*Louisiana, Monroe. The building of the Ouachita Cotton Mills are nearing completion and will soon be ready for installation of the machinery, some of which has already been purchased.

—Maine, Saco. The York Manufacturing Company will erect a new mill, 300 by 180 feet, three stories high. Work will be started as early as possible in the spring. .

—*Mississippi, Kosciusko. Work is being pushed toward completion on the new plant for the Kosciusko Cotton Mills, of which Walter Burgess is president. It is now stated that the mill, which they contemplated having in operation around the first of January, will be ready to start by May.

—*Mississippi, Laurel. The machinery is being set up in the new plant of the Laurel Cotton Mills, of which G. S. Gardiner is president. In making full report of the mill in an earlier issue, it was thought the plant would be ready to start operations by the first of February, but this they were unable to do, having many setbacks.

—New Jersey, Jersey City. The American Cotton Goods Company has been incorporated with capital stock of $500,000 by Geo. N. Cotton, D. T. Hendrickson and Geo. R. Steinberger, for manufacturing cotton and woolen goods. Company's main office is at 571 Newark Avenue.

—*North Carolina, Charlotte. The new mill to be erected here, and in which R. M. Miller, Jr., is interested, will be known as the Elizabeth Mills, capitalized at $100,000. They will start work on foundations, April 1st, and expect to be ready for production of goods Oct. 1st, 1901. Combed and carded 2 ply yarns, from 40s to 60s, will be made. Will have equipment of 5000 cotton spindles and 3000 twister spindles. R. M. Miller, Jr., will be president and treasurer of the company, which has not yet been organized.

—*North Carolina, Concord. The machinery is being installed in the Gibson Mill, which will be put in operation as soon as possible.

—*North Carolina, Goldsboro. The Borden Manufacturing Company will start operations in their new plant in about three weeks. This plant, which will manufacture yarns, contemplated being ready to start last October, but were unavoidably delayed.

—*North Carolina, Henrietta. The Cliffside Mills have been incorporated by T. B. Lovelace, R. R. Haynes, Henry Jenkins, L. A. Holland, and Gaither Kennedy, with capital stock of $80,000. Project has been previously mentioned in detail.

—*North Carolina, Lexington. At a meeting recently held by the stockholders of the Nokomis Cotton Mills, it was voted to increase the capital stock from $100,000 to $200,000 and equip the mill with 12,000 spindles and 400 looms, instead of 5000 and 150 as contemplated when first under construction. The main building is 75 by 340 feet, two and three stories high.

—*North Carolina, Spartanburg. Work on construction of buildings for the Saxon Cotton Mills has been completed. It is expected to have the plant, in which machinery is being set up, ready to start production of goods March 1st.

—North Carolina, Staley. It is reported that W. G. Robertson and Thomas Davis are interested in the new cotton mill being built here, and which will soon be ready for installation of the machinery.

—*Rhode Island, Providence. Geo. H. Clark is president, Geo. P. Clark, treasurer, and Samuel Ward, superintendent of the Columbia Narrow Fabric Co., recently organized with capital stock of $100,000. They will start operations about Feb. 15th, making cotton and silk elastic and non-elastic tapes, webbings, etc.

—*Rhode Island, Westerly. The Solway Mills Company expect to have the plant in operation March 15th, giving employment to about 200 people. The new machinery cannot be installed until the woolen machinery has been taken out of the old mills of Dennison, Walker & Co., which they purchased.

—*Rhode Island, Woonsocket. George Mason, formerly of the American Narrow Fabric Co., which has discontinued business, has installed 50 braiding machines in space previously occupied by the Perforated Pad Company. He has had plans drawn for the erection of a new mill here, 200 by 50 feet, one story high.

—*South Carolina, Anderson. The Cox Manufacturing Co. has started operations in their mill, making fine yarns. Plans are being prepared for an addition to be made for purpose of doubling the present capacity. They contemplate having new addition running by first of May, when they will start weaving fine cotton cloth.

—*South Carolina, Charleston. As soon as arrangements can be completed, work will be started on erection of the new mill for the Royal Bag & Yarn Mfg. Co. Employment will be given about 300 operatives.

—*South Carolina, Greenville. Machinery is about all placed in the Brandon Mills and operations begun in the spinning room. It is expected that the mill will be running in full in a few weeks.

—*South Carolina, Greenville. The machinery is being installed in the new mill recently completed by the F. W. Poe Mfg. Co. This will be a duplicate of the present mill, i. e., 25,088 spindles and 752 looms.

—*South Carolina, Union. The Aetna Cotton Mills have been permanently organized with capital stock of $125,000. W. H. Sartor is president and treasurer of the company. Work will proceed at once on erecting and equipping the mill.

—*South Carolina, Whitmires. The Glenn-Lowry Manufacturing Co. has building well under way and will soon be ready to place orders for machinery. They will manufacture wide print cloth. The mill will be equipped with not less than 25,000 spindles, and a proportionate number of looms.

—*Tennessee, Chattanooga. The new batting mill to be established here by D. J. Griffin, and operated by steam, will be equipped with dye and bleaching machinery, for which he is receiving estimates, also on shafting and hangers.

—*Texas, Bonham. The engine and machinery has been set up in the Bonham Cotton Mills. The roofing is completed and window frames are being put in. It is expected that the mill will be running by May 15th.

—*Texas, Cuero. Bids are being received by J. B. Ashworth, secretary of the Cuero Cotton Mill Co., for the erection of the buildings. This concern, of which J. A. Graves is president, will have a 5000 spindle plant.

—*Texas, Dallas. Contracts will soon be awarded for remodelling mill building and equipping same with machinery for cotton mill at this place, of which J. E. Wylie is at the head. As previously stated, 3,000 spindles will be installed. Electricity will be power used.

—*Texas, Gonzales. Contract has now been let for the construction of the Gonzales Cotton Mills, and work will be pushed to completion as rapidly as possible.

Enlargements and Improvements.

—Alabama, Birmingham. The Avondale Cotton Mills are to increase the number of spindles and looms from 33,000 and 1,000 to 40,000 and 1,100, respectively.

—Alabama, Eufaula. The Chewalla Cotton Mill has been enlarged. An addition for weave room has been completed and 30 new looms will be installed. They will also add 1,500 additional spindles.

—*Alabama, Florence. The Ashcroft Cotton Mills have decided to increase the capital stock $40,000, and will add new machinery, early in the spring.

—*Connecticut, Danielson. It is reported that 17,000 new spindles and 400 new looms will be installed in the Danielsonville Cotton Mills, previously reported shut down. A new kind of sheeting, for which Geo. P. Taylor, owner, has secured patent, will be manufactured.

—*Connecticut, Middletown. The Russell Manufacturing Co. has completed erection of new addition upon which report has been made in previous issue.

—Connecticut, Westport. The Lees Manufacturing Co. is installing new machinery for making bicycle laces.

—Connecticut, Willimantic. It is reported that the Windham Manufacturing Co. contemplate erecting a large weave shed.

—Georgia, Columbus. The Eagle & Phoenix Mills will replace 110 of the looms in their No. 3 Mill with Northrop looms.

—Georgia, Jefferson. The Jefferson Cotton Mills, manufacturing 4 yard sheeting, will install 50 additional looms in the plant. Mill will then be operated night and day.

—Georgia, Macon. The Payne Cotton Mills will issue $100,000 in bonds for purpose of making improvements to the plant.

—*Georgia, Monroe. The capital stock of the Walton Cotton Mill Co. was increased at a meeting held recently by the stockholders. They will install 5,000 additional spindles in the plant and expect to have same in operation April 1st.

—Georgia, Quitman. The capital stock of the Atlantic & Gulf Mills has been increased from $75,000 to $100,000.

Maryland, Warren. The Warren Manufacturing Company is installing new machinery in the plant, which manufactures ducks and cottonades.

—Massachusetts. Lowell. An addition, 170 by 48 feet, two stories high, will be built to the dye house of the Massachusetts Cotton Mills, for purpose of increasing the dyeing capacity of the plant.

—New York, Lockport. The Niagara Textile Company will soon make enlargements to the mill. Plans will be made and work started on building early in the spring.

—*North Carolina, Gastonia. The Trenton Mill No. 2, about which reports have been previously made concerning new machinery, etc., is nearly completed, machinery having nearly all been installed.

—North Carolina, Henderson. A new addition, 40 by 75 feet, is to be made to the Henderson Cotton Mills.

—*North Carolina, Sanford. The Sanford Cotton Mills, of which W. H. Watkins is president; T. L. Chisholm, treasurer and W. T. Hurly, superintendent, inform us that increase of stock has bee nmade for purpose of filling up the mill, started last summer by installing 4000 additional spindles, giving them a total of 9000. They make yarns and 4-yard sheetings.

—Pennsylvania, Philadelphia. A two-story brick spinning mill, 26 by 80 feet, is being erected for John M. Kennedy, Jr., on Jasper Street, below Westmoreland Street.

—*Rhode Island, Warren. The Parker Mills, Fall River, have put in nine spinning frames in their No. 2 mill at this place. They expect to add 300 new looms at an early date, giving the plant at total of 1,182, when completed.

—*Rhode Island, Woonsocket. The National Pile Fabric Company, which recently purchased the plant of the American Narrow Fabric Company, expect to have the plant running in full March 1st. Seventy-six new looms will be installed in the next few days and other machinery will soon arrive.

—South Carolina, Abbeville. The Abbeville Cotton Mills have installed 5600 additional spindles in the plant.

—South Carolina, Columbia. The capital stock of the Richland Cotton Mills has been increased to $300,000.

—South Carolina, Edgefield. The Edgefield Mfg. Co. contemplate making an enlargement to the plant.

—*South Carolina, Greenwood. The Grendel Mills have completed additions to the plant. Mill has now total of 25,000 spindles. On the first floor there are 448 new Draper looms.

—*South Carolina, Greenville. The Mills Manufacturing Co. has completed addition 7,000 more spindles and 200 looms to the plant.

—*South Carolina, Marion. Work is soon to be started on extension of the Ashby Cotton Mill reported to be made in an earlier issue.

—Tennessee, Covington. The Tipton Cotton Mills will expend about $50,000 more for purpose of installing 2500 additional spindles in the plant.

Mills Starting Up.

—*Alabama, Opelika. Operations were started in the new plant of the Opelika Cotton Mills, February 15th, manufacturing warp yarns, 30s to 60s.

—*Mississippi, West Point. Operations were started February 7th in the West Point Cotton Mills, which manufactures 2-ply yarns, 30s to 40s.

—*North Carolina, Hickory. Operations have been started in the E. L. Shuford Mfg. Co.'s cotton mill. Mill has been equipped with automatic sprinklers and electric lights.

—*North Carolina, Mount Airy. The Hamburg Cotton Mills, recently purchased by Dr. D. W. C. Benbow, will be put in operation soon, unless he finds a purchaser for the plant.

—*South Carolina, Anderson. The new plant of the Riverside Manufacturing Co. has been put in operation, making 20 to 30 yarns.

—*South Carolina, Westminster. The Cheswell Cotton Mills have started making cotton cloth. Additional looms are to be installed.

—Texas, Sherman. Work has been resumed in the Sherman Cotton Mill with complement of help.

—*Virginia, Norfolk. Operations have been started in the Cotton Oil & Fibre Company's yarn mill.

Mills Shutting Down.

—Rhode Island, Hope Valley. The Locustville Mill, Nichols & Langworthy Machine Co., has been shut down for an indefinite time.

Woolen.

New Mills.

—*Massachusetts, Webster. Work has been started on removing machinery in L. D. Perry's mill to the new plant, recently completed. It is expected that the new mill will be running in full by April 1st.

—*Pennsylvania, Chester. The Emmett Chester Worsted Spinning Company has been incorporated with capital stock of $75,000. This is the company which we previously reported recently located in the Law & Deveney Mills, to manufacture worsted yarns. They contemplate having the mill in operation by the first of April.

—*Pennsylvania, Indiana. At a recent meeting of the stockholders of the new Indiana Woolen Mills, E. M. Lockard was elected president and J. A. Findley, secretary of the company recently organized with capital of $25,000. It is expected to have the mill, which will manufacture blankets and skirt patterns mostly, in operation by June 1st.

—Pennsylvania, Philadelphia. Albert Herbst, formerly with Herbst & Jones, has purchased the buildings formerly occupied by Thomas Jaggers, woolen yarn spinner, at Emerald Street and Allegheny Avenue. Mill will be equipped with new machinery for manufacturing worsted yarns, with the Bradford system.

—*Rhode Island, Providence. The Puritan Worsted Mills is name taken for plant recently established here by George and William Legg and John C. Arden, for making piece dyes and worsteds. The dyeing and finishing will be done outside. Company has capital stock of $15,000, and will operate 20 looms.

—*Rhode Island, Washington. The Spring Lake Manufacturing Co. has been formed with John Galvin as manager, to operate the Spring Lake Mills, in which J. F. Sunderland and J. H. Dews are interested. They will manufacture woolen yarns.

—*Rhode Island, Providence. Chas. Loridan is president, agent and superintendent, and Ambrose Feely, treasurer, of the Loridan Worsted Co., 43 Sabin street, recently incorporated with capital stock of $21,000. They will start immediately manufacturing worsted yarns spun on French system.

—*Tennessee, Memphis. Geo. E. Cope, P. O. Box 223, informs us that new company for manufacturing rugs has not yet been formed, but that they are getting information, etc., on material and methods for making same. A new building will be constructed.

—Utah, Logan. Edmund Buckley, operating the Star Valley Woolen Mills, at Afton, Wyoming, will move his plant to this place. Site has not yet been decided upon. A meeting, under charge of Mayor Anderson, will be held to consider offering suitable inducements to him.

—Virginia, Waynesboro. It is reported that Mr. Bockee, a second-hand machine dealer of New York, whom we previously reported interested in establishment of a knitting mill at Staunton, is installing machinery for making blankets in buildings leased here and Basic City. It is said that employment will be furnished about 75 girls.

Enlargements and Improvements.

—Connecticut, Mystic. The Mystic Manufacturing Company has recently added 8 new looms to the plant, other new and improved machinery has also been installed.

—Connecticut, Stamford. An additional set of cards has been installed in the Mianus Manufacturing Co.'s plant, giving them a total now of four sets.

—*Indiana, Mishawaka. The Mishawaka Manufacturing Co. has started work on erection of another two-story brick building to be erected replacing old ones. The second story of new addition will be used for manufacturing rubber shoes.

—Iowa, Manchester. J. S. Jones has purchased the Manchester Woolen Mills and is making extensive repairs in all the departments. The plant will soon be started up on full time, making fine blankets.

—Maine, Ellsworth. An additional set of cards is being installed in the Ellsworth Woolen Mills, recently purchased by C. A. Dews.

—*Maine, North Vassalboro. The Vassalboro Mills of the American Woolen Co., are installing four sets of Davis & Furber cards, which are now being set up.

—Maine, Sanford. The Sanford Mills have installed six additional plush looms in the plant.

—Maine, Sangerville. The Sangerville Woolen Co. and the Carleton Mill Co. will equip their mills with electric lights. A new dam and power house is to be built here for lighting purposes and the above named concerns are among those which have subscribed for lights.

—Maine, Skowhegan. Twenty new looms are being installed in the Anderson Mills of the American Woolen Company.

—Minnesota, Faribault. Work has been started in the new pants factory recently established by the Faribault Woolen Mills, C. H. Klemer & Sons, proprietors.

—New Jersey, Passaic. The Passaic Woolen Company has recently added 16 new Knowles looms.

—Pennsylvania, Darby. Geo. Grayson & Co. have purchased the carding and spinning machinery in Thomas Jaggers mill, Philadelphia, and will remove same to mill here.

—Pennsylvania, Montello. The Hendel Hat Company is removing the plant to Reading, where a new mill has recently been completed.

—Rhode Island, Oakland. It is reported that the Oakland Worsted Company will erect a new mill in the spring.

—*West Virginia, Barnesville. As soon as the weather permits, the Barnesville Mfg. Co., which is at present erecting a new store room, will build a brick addition, 76 by 24 feet, to the mill. About 10 new broad looms will be installed, when completed.

Mills Starting Up.

—*California, Eureka. The Humboldt Bay Woolen Mills, A. W. Berr, superintendent, are now in operation.

—Maine, Sangerville. St. Ronan's woolen mill has been put in operation again, after being idle since January 1st. Much needed repairs and improvements have been made to the mill during shut down. The mill, which has been formerly operated by David R. Campbell & Sons, is now controlled by the Campbell Manufacturing Co., F. R. Campbell, president; A. C. Campbell, general manager and D. C. Campbell, secretary and treasurer.

—Maine, Turner. The Turner Woolen Mills, F. T. Faulkner, proprietor, have been put in operation after being idle for some time.

—*Massachusetts, Lawrence. Operations have been resumed in the Hartley Wool Scouring Mill, which has been idle owing to financial difficulties.

—*Massachusetts, Millbury. Operations will be resumed in C. T. Aldrich's shoddy mill, recently damaged by fire.

Mills Shutting Down.

—Connecticut, Sandy Hook. The Sandy Hook Woolen Co.'s mill has been shut down indefinitely.

—New Jersey, Picton. The Bloodgood Mills of the American Felt Co., have been shut down.

—New York, West Troy. Jas. Roy & Co.'s mill No. 2 at Watervliet has been shut down, and it is not known when operations will be resumed.

Knit.

New Mills.

—Alabama, Anniston. The Anniston Knitting Mill has been organized here by E. L. Tyler, A. L. Tyler, Jr., and W. W. Stringfellow, for erecting and operating a mill to manufacture hosiery. It is expected that the plant will be ready to start operations by March 1st.

—*Alabama, Huntsville. The W. H. Rowe Knitting Company has been incorporated with capital stock of $300,000; W. H. Rowe, Jr., president; Frances J. Wood Rowe, treasurer; Elmer E. Hartzell, secretary, and Charles E. Shaver and Thomas A. Galvin, superintendents. Work will be started at once on erection of the plant, which they contemplate having ready for production of goods, May 1st.

—*Alabama, Wilsonville. Justin C. Jackson, whom we previously reported interested in project of erecting a knitting mill here, has decided to invest about $7,000 in a small plant, for making hosiery. Equipment has not yet been secured.

—Florida, Waukeenah. A project is now on foot for the erection of a knitting mill at this place. W. P. Bellinger is interested. It is reported that work will be started soon on erection of the mill, as site has already been selected.

—Georgia, Athens. The Standard Manufacturing Company is to erect another large knitting mill. It is stated that they also contemplate manufacturing overalls and similar clothing in the plant. Work will be started at an early date on erection of the buildings.

—*Georgia, Cedartown. The buildings of the Joseohine Mills, which will manufacture high grade cotton yarns, and convert same into hosiery and underwear, are fast nearing completion.

—*Georgia, Elberton. The new mill to be established here by N. G. Long, who is investigating the project, will be for the manufacture of hosiery and underwear.

—*Georgia, Fort Valley. The Fort Valley Knitting Mills, of which F. C. Miller is president, J. M. Jones, manager, and W. A. Canfield, superintendent, have completed intallation of machinery and will start operations next week. Ladies' underwear will be made.

—*Georgia, Tifton. The Tifton Knitting Mills expect to be ready to start operations on the 18th inst. They will make ladies' medium hosiery.

—*New Jersey, Delanco. The Star Knitting Mills is the name of a new factory, of which Charles E. Barnitz is the proprietor. It starts up about the middle of February, on a fine grade of ladies' and men's seamless half hose, with seven machines, and they may put in ten more, which have not yet been contracted for. He would consider first-class second-hand machines, if in thoroughly good order.

—Pennsylvania, Palmyra. A stocking factory is under construction at this place by Samuel F. Engle, of this place, and John A. Balsbaugh, Hockersville. The building will be 32 by 50 feet, two stories high. They expect to have the mill ready to begin reproduction of goods in about three months.

—*Pennsylvania, New Bloomfield. The buildings to be occupied by the new knitting mill are being remodelled. It is expected that some of the machinery will be installed in March.

—South Carolina, Landrum. The Blue Ridge Hosiery Mill Co. has been incorporated with capital stock of $20,000 by Joseph Lee and Jacob Carpenter. (Landrum) A. G. Harrison, B. T. Earle and H. L. Bomar (Spartanburg.)

—Tennessee, Knoxville. Rhea Ernest of Greenville, Tenn., contemplates erecting a $25,000 knitting mill at this place. It is not decided whether hosiery or underwear will be made.

—*Tennessee, Knoxville. The Cumberland Knitting Mills, which have been incorporated with capital stock of $25,000, J. W. Brownlee, president and manager; W. M. Brownlee, treasurer; Dick W. Boyd, secretary, and T. J. Whittaker, vice-president and superintendent, will start operations March 1st. Plant will have equipment of 20 knitting machines for making ladies' summer vests and heavy suits of cotton. They have leased their quarters.

—Virginia, Portsmouth. A movement is under way for the starting of a large knitting mill here by local parties. It is expected that the mill will be ready to start operation by the middle of April.

Enlargements and Improvements.

—Georgia, Griffin. The Georgia Knitting Mills, manufacturers of men's cotton ribbed underwear, are considering the advisability of putting in a dyeing plant.

—Indiana, Fort Wayne. The United Knitting Mills are to be enlarged and employment will be given to about 25 additional people.

—Iowa, Des Moines. At a meeting recently held by the stockholders of the Iowa Knitting Company, it was voted to increase the capital stock from $25,000 to $50,000, for purpose of making enlargements and improvements to the plant. Of this amount, $15,000 has already been subscribed.

—*Maryland, Hagerstown. The Blue Ridge Knitting Company write us that they will build no addition to the plant, but have leased room from adjoining property and purchased property which they now occupy. The mill has an equipment of 94 Mayo knitting machines.

—New York, Fonda. An addition, 45 by 60 feet, three stories, is to be built to the Cayadutta Knitting Mill.

—New York, Johnstown. The Diana Knitting Company has voted to increase the capital stock from $50,000 to $100,000.

—Pennsylvania, Cressona. Additional machines are to be installed in the Beck Hosiery Co.'s mill.

—Pennsylvania, Lewistown. A new mill, 130 by 50 feet, two stories, is to be erected for the Lewistown Knitting Mill, Thompson Bros., Milroy, proprietors. Mill is to be equipped with steam power, electric light plant and heating apparatus, for which bids are being received.

—Pennsylvania, York. Work has been started on erection of an annex, 15 by 10, one story, to the dye house of the York Knitting Mills.

—*South Carolina, Union. We have been advised by the Excelsior Knitting Mills, previously reported to increase capital, that that will be done to cover larger business and to add 100 more knitting machines to the plant.

Mills Starting Up.

—*Alabama, Birmingham. J. A. Yates & Co.'s knitting mill has been put in operation. Misses, boys and men's hose are made. Full capacity of the plant is 150 dozen per day.

—*Florida, Jacksonville. Capt. C. E. Garner is president; W. B. Shaver, secretary and manager and A. S. Hubbard, treasurer of the Jacksonville Knitting Company, recently incorporated with capital stock of $25,000. Work is being pushed on setting up additional machinery and it is expected that the plant, which has begun on a small scale, will be running in full in about three weeks. They will make ladies' underwear, as heretofore made in the mill.

—*Pennsylvania, Ashley. The new hosiery mill established here by West Bros., of Plymouth Pa., is in operation. The dyeing is done at the main mill at Plymouth.

—*Tennessee, Knoxville. Work has been completed on installation of the machinery in the Standard Knitting Mills, and plant put in operation. Product will be men's underwear.

Mills Shutting Down.

—Connecticut, Norfolk. The Norfolk & New Brunswick Hosiery Company has closed its mill here permanently and will remove the machinery to mill at New Brunswick, N. J.

—Pennsylvania, Tamaqua. The hosiery mill operated at this place by Geo. Schmidt & Bro., will be shut down June 1st, and machinery moved to Nicetown, where company operates another plant.

Silk.

New Mills.

—Michigan, Middleville. The Warren Featherbone Company, of Three Oaks, has recently purchased a new factory building here, which is being remodeled and will be operated as a branch plant. In addition to article manufactured, ribbons will be made.

New Jersey, Passaic. The Alexander Silk Mill, which leases their present quarters, contemplates building a mill of its own.

—New Jersey, Paterson. The Spring Silk Company has been incorporated with capital of $25,000 by Richard Matchett, Thomas H. Symington and David Matchett. Thomas J. Beardmore is agent of the concern, with office at 152 Market Street.

—New Jersey, Paterson. A silk plant has been established in the Harmony Mill on Van Houten Street by Herman W. Urbach, under name of the Eagle Silk Manufacturing Company.

—New Jersey, Paterson. A new concern, known as the Emblem Silk Co., has leased space in the Cooke Mill, and is operating 22 looms manufacturing silks.

—New Jersey, Paterson. The Jewel Silk Mill has been purchased by The Neuberger-Meidendorp Co., recently formed to manufacture tie silks. The mill has an equipment of about 50 broad silk looms.

—New Jersey, Paterson. Messrs. Kruger & Stohn have leased the mill formerly occupied by Samuel Lederer at Lakeview, and started manufacture of tie silks. Mill is equipped with 60 looms.

—*Pennsylvania, Pennsburg. The new mill at this place will be operated under name of the Eureka Ribbon Company.

Enlargements and Improvements.

—*New Jersey, Paterson. The Helvetia Silk Mill, which we previously reported to build addition to plant, expect to start operations in same about March 1st. Thirty new looms will be installed for manufacturing satin back velvet ribbons.

Mills Starting Up.

—Pennsylvania, Kutztown. Operations have been resumed in full in the Kutztown Silk Throwing Company's mill, which has been shut down for some time on account of dullness in the silk trade.

Mills Shutting Down.

—Massachusetts, Milford. The large plant of the Magid-Hope Silk Company was shut down February 21st. It is thought that operations will be resumed either March 11th or 18th.

—New Jersey, Jersey City. The Phalanx Silk Company, which has been operating a branch mill at Phillipsburg, is removing the machinery to the main mill at Jersey City. The dullness in silk trade is reported as cause of abandoning the branch plant.

—Pennsylvania, Pittston. The Sterling Silk Company's mill has been shut down indefinitely. Concern is having trouble with the operatives regarding wages.

Miscellaneous.

New Mills.

—*California, Oakland. The building for the new plant of the California Flax Mills has been completed and is ready for installation of the machinery.

—Massachusetts, No. Adams. It is reported that the Arnold Print Works contemplate installing several additional machines in the plant.

—*Pennsylvania, Royersford. Machinery is being installed in the Royersford Dye & Bleach Works, which were rebuilt, after having been destroyed by fire. It is expected that operations will be started in about a month.

Enlargements and Improvements.

—*Massachusetts, Indian Orchard. The American Flax Co., which recently removed here from Meredith, N. H., expects to have the looms running in two or three weeks.

—*North Carolina, Greensboro. John C. Lowry, of Coulter & Lowry, Philadelphia, has purchased the plant of the Southern Finishing & Warehouse Co. New machinery will be installed and the plant put in operation at an early date.

Mills Starting Up.

—*New Jersey, Paterson. The plant of the Close & Burke Silk Dyeing Company, which was previously reported as having assigned, has been put in operation by Pierre Thonnerieux.

Fires.

—Canada, Ontario, Inglis Falls. The Inglis Woolen Mills have been totally destroyed by fire. There was some insurance on buildings and machinery.

—New Jersey, Paterson. Jacob Dine, operating a silk throwing plant in the Mallory Mill, recently destroyed by fire, sustained a loss of $30,000, of which $12,000 was on machinery.

—North Carolina, Raleigh. The Raleigh Hosiery Co., which recently completed erection of new buildings, and in which additional machinery was set up, have sustained a loss of about $18,000 by fire. About $20 000 worth of new machinery will be purchased immediately to replace that destroyed.

—Pennsylvania, Philadelphia. The Industrial Dyeing and Finishing Works, 3829-3833 Frankford Avenue, were damaged by fire recently, causing loss of about $1000 on building and contents.

—Pennsylvania, Reading. The seamless hosiery mill, only recently put in operation by Richard R. Parker, in building formerly occupied by Wilson C. Shantz, failed, was destroyed by fire. About 21 of the total 41 machines were in operation. Loss is estimated at about $13,000, with insurance of $12,500. As soon as Mr. Parker can secure suitable site, operations will be resumed.

—Wisconsin, Ripon. The Ripon Underwear Company's plant was destroyed by fire, with loss of about $15,900, fully covered by insurance. The company contemplate rebuilding mill at an early day.

Failures and Suspensions.

—Pennsylvania, East Stroudsburg. Thomas Henry, Jr., who recently removed his plant to this place from Philadelphia, and operated same as the Melrose Hosiery Mill, has made an assignment to his brother, William G. Henry, of Philadelphia. The liabilities are estimated at about $8000. It is reported that operations will be resumed at an early date, and that the difficulty can be satisfactorily arranged.

—Pennsylvania, Philadelphia. William Peel & Co., manufacturers of shoddy, Germantown, have made an assignment of real estate and personal property to F. Pierce Buckley.

Facts and Gossip.

—Alabama, Nottingham. A knitting mill for manufacturing hosiery, is contemplated at this place by J. F. Reynolds. It is thought likely that underwear will also be made.

—Alabama, Talladega. A $10,000 knitting mill is contemplated for this place by J. C. Jackson and others.

—Alabama, Wetumpka. F. O. McCormick, of New York, is interested in the erection of a cotton and knitting mill here. It is proposed to organize a company with capital stock of $100,000. Work will be started on erection of buildings about the middle of April.

—California, San Francisco. The Lick Woolen Company has been incorporated with capital stock of $250,000 by H. G. C. Atwater, G. A. Kron, D. A. Comstock, L. E. Jones, and J. G. Scott. They will erect a woolen mill on the old Lick Mills property purchased, near Agnews.

—*Connecticut, Norfolk. B. Darrow informs us that nothing has yet been done regarding organization of company to operate the Norfolk & New Brunswick Co.'s plant. If the plant is run simply on yarns, it is thought the above named concern would be operators.

—Georgia, Quitman. Judge Joseph Tillman is interested in erection of a hosiery mill contemplated here.

—Georgia, McRae. It is reported that Messrs. Thurman and Kinchen are considering the establishment of a $50,000 cotton mill here.

—Georgia, Waymanville. Owing to a disagreement among the stockholders of the Wayman Cotton Mills, the plant has been placed in the hands of a temporary receiver.

—Kentucky, Louisville. The factory building of the Old Kentucky Woolen Mills, recently placed at auction, has been purchased by George W. Tarlton for $44,500. The boilers, engines and belting were purchased by J. H. Quast & Son for $10,000. The machinery was offered for sale, but there was no bidder on it; same was withdrawn.

—Louisiana, Newroads. Z. T. Henderson is interested in the organization of a stock company to erect and operate a cotton mill. Nothing definite has yet been arranged.

—Massachusetts, Charlton City. The satinet mill of the James C. Copp Estate, of which Geo. Fitzgerald is manager and superintendent, was bid in by Charles A. Hill, of Worcester, for $3,000 at recent sale. Mr. Hill, who formerly owned an interest in the plant, now has complete control. It is thought that the mill will soon be put in operation.

—Massachusetts, Clinton. The Clinton Braid Company has been incorporated with capital stock of $7500, and succeeds the Clinton Binding Co. Alexander S. Paton, Leominster, is president; Charles A. Kabley, Worcester, vice-president and Thomas S. Davis, treasurer. Eugene McCarthy, originator of the concern, is in the employ of the new corporation.

—*Massachusetts, Oakland. The property of the L. M. Harris Manufacturing Co., having been secured by the Metropolitan Water Board, the machinery is now offered for sale. Alfred N. Whiting, treasurer, 167 Pleasant Street, Worcester, has matter in charge, regarding prices, etc..

—*Massachusetts, Spencer. Simeon Taylor, superintendent of Beebe, Webber & Co.'s mills, has recently purchased Mr. Morey's interest in the Spencer Textile Co., but will retain his present position. They expect to have the total number of looms, seventeen, in operation soon.

—Massachusetts, Worcester. The Queensbury Mills, manufacturing worsteds, H. Hodgson, proprietor, have been incorporated under Maine laws, with capital stock of $100,000. H. Hodgson, is president and treasurer.

—*New Jersey, New Brunswick. A decree of foreclosure has been granted W. & J. Sloane, under which they will take possession of the carpet mill, formerly operated by John Rippel. It is stated that the plant will be offered for sale.

—New Jersey, Paterson. The firm of Fogle, Killin, Kane & Co., manufacturers of all kinds of silks, has been dissolved. The business will be carried on by Messrs. Fogle and Killin, as Fogle & Killin.

—New Jersey, Paterson. The Lodi Dry Dyeing Company has been incorporated, with capital stock of $100,000. They will dye, print, and finish silks, velvets, cottons and woolens. This concern will probably operate plant of which Albert Rau is proprietor.

—New Jersey, Paterson. A new company is to be organized with capital stock of $25,000 to operate the mills formerly run by James E. Daly. Michael Dunn and Henry Van Haste are interested in the new movement.

—New Mexico, Carlsbad. An effort is being made for the establishment of a woolen mill at this place.

—New York, Falconer. The Falconer Worsted Mills have been incorporated with $50,000. The new directors of the company are: Alfred Hine, Grant A. Forbes, George O. Meredith and Asa Hind. This company manufactures medium and fine worsted yarns.

—New York, Fonda. The Cayadutta Knitting Company has been incorporated with capital stock of $30,000 by H. S. Hilton, K. C. Radliff and P. Y. Brinton. They will operate the Cayadutta Knitting Mills, making all kinds of knit goods.

—*New York, Hornellsville. Edwin S. Brown, who formerly operated a silk mill at this place, is interested in the new plant which will be located in the Rockland Silk Mills (idle) and the old Rawson Manufacturing Company's plant by the Liberty Silk Company of New York City.

—New York, Newburg. William Foster, of the Newburg Woolen Mills, has been appointed temporary receiver of the Crawshaw Carpet Company, manufacturers of carpets and rugs. It is stated that it was impracticable to continue the plant, owing to differences among the stockholders. The liabilities are estimated at about $35,000. The accounts will be paid in full and the company will be re-organized.

—New York, New York. The Fulton Bag & Cotton Mills, Atlanta, Ga., have leased a large building at 236-238 Spring Street, and will equip same for manufacturing bags. Operations will be started as soon as building can be put in readiness.

—New York, Rochester. The Rochester Batting Mills have been incorporated with capital of $15,000, with James Palmer, Jr., president; Charles F. A. Young, secretary, and John Kubel, treasurer. They manufacture all ....s of cotton batting, surgical cotton and fire proofing of cotton batting.

—*New York, Watertown. The Elwood Silk Manufacturing Company's mill will be sold under mortgage foreclosure to satisfy the bondholders.

—North Carolina, Kernersville. J. M. Greenfield contemplates erecting a knitting mill for manufacturing hosiery, and is receiving estimates on cost of buildings, machinery, etc.

—*North Carolina, Maxton. H. C. McNair, formerly secretary and treasurer of the Maxton Cotton Mills, has purchased the plant which was recently placed for sale at public auction.

—North Carolina, Pine Bluff. Applications for space have been made by a hosiery mill in new building to be erected here by John T. Patrick.

—Ohio, Roscoe. The old woolen mill property was purchased by Thomas LeRetilley at sheriff's sale for $1400, to satisfy a judgment held against A. D. Prentice, the owner.

—Ohio, Toledo. R. W. Wise of Magnetic Springs, O., is corresponding with J. W. Flowers, secretary of the Chamber of Commerce, regarding the establishment of a woolen mill here, for manufacturing women's dress goods.

—*Ontario, Lambton Mills. The Lambton Mills, branch plant of the Canada Woolen Mills, recently destroyed by fire, will not be rebuilt. Company will remove remaining property to main works at Hespeler.

—Pennsylvania, Chester. The Jordan Manufacturing Company, Philadelphia, and the Arasapha Manufacturing Company have been consolidated under name of the Arasapha Manufacturing Company, with Wm. S. Blakely, president; Irving W. Jordan, secretary and treasurer and Robert Kineavy, superintendent.

—Pennsylvania, New Bloomfield. It is reported that J. W. Gotwalt is interested in establishment of a hosiery factory here.

—*Pennsylvania, Philadelphia. The receivers of James Martin & Co., dyers and printers recently reported failed, have been granted an order to continue the business.

—Pennsylvania, Pottsville. Efforts are being made to secure the establishment of a silk mill here for manufacturing satins. The Board of Trade is interested in the matter.

—*Pennsylvania, Steelton. The Dauphin Hosiery Co., which has been incorporated, with capital stock of $6000, succeeds the Shaar & R..odes Hosiery Co., having taken possession last November. E. A. Hirner is president; Samuel Couffer, treasurer and Y. B. Rhodes, superintendent. This mill, which manufactures cotton half-hose, is equipped with 34 knitting machines, 7 ribbers and 2 loopers.

—Rhode Island, Bristol. The Bristol Wool Company, capital stock $15,000, has made application for charter for purpose of buying, selling and manufacturing wool, waste, shoddy, etc.. Louis J. Ryan, Frederick J. Ryan and James F. Corrigan, of Providence, are the incorporators.

—South Carolina, Central. A cotton mill is projected at this place.

—South Carolina, Edgefield. It is reported that a movement is on foot to establish a knitting mill here.

—South Carolina, Greenwood. It is reported that a project is on foot for erecting another cotton mill here, although details concerning same have not yet been given out.

—South Carolina, Greenwood. Thomas B. Lee is receiving estimates, etc., on equipment for a cotton wadding factory of 1,000 pounds daily capacity.

—South Carolina, Greer Depot. The Brooks Manufacturing Co. which made cotton bats and comforts, has discontinued business. The plant is advertised for sale.

—South Carolina, Orangeburg. The Orangeburg Knitting Mill is considering a proposition to add a plant for manufacturing yarn. If this is decided upon favorably by the stockholders, the capital stock will be increased and the plant moved where more space can be secured to build houses for the operatives.

—Tennessee, Knoxville. The jeans plant of the Knoxville Woolen Mills has been shut down for about six weeks, for purpose of reducing stock, as per order of the Jeans Manufacturing Association to which concern belongs.

—Virginia, Petersburg. The Blue Ridge Manufacturing Co.'s mills have been purchased by E. G. Davis, of Henderson, N. C., secretary of the Henderson Cotton Mills.

—Tennessee, Shelbyville. It is reported that a woolen mill, with a knitting department attached, it is to be established here.

—Texas, Celeste. Efforts are being made to accept a proposition recently made to this place regarding establishment of a cotton mill.

PERSONAL RECORD.

Cotton.

—J. D. Boswell, former superintendent of O. A. Robbins Co., at Charlotte, N. C., has changed his position, and is now with the Sutro Cotton Mills, Yorkville, S. C.

—Thomas Blacklock, who recently resigned his position as boss dyer for the Pawtucket Dyeing & Bleaching Co., Pawtucket, has taken a like position in the mills of the Hamilton Web Co., Hamilton, R. I.

—Morgan H. Baldwin, formerly of the Pelzer Mfg. Co., Pelzer, S. C., is now superintendent of the Monaghan Mills, Greenville, S. C.

—M. L. Burton has been engaged by the Batesville Mfg. Co., Greenville, S. C., as superintendent. He was formerly of the Tucapau Mills Co., Tucapau, S. C.

—Joseph Bennett has been appointed superintendent of the Windsor Print Works, North Adams, in place of D. A. Russell, who is now manager. Mr. Bennett has for some years been at the head of the color department.

—John C. Bauer, of Dodgeville, Mass., has recently accepted a position with W. K. Sanborn, superintendent of the Arrowanna Spinning Mills, Middletown, Conn., as second-hand of carding.

—Eaton Binns has accepted the position of overseer of spinning at the Bigelow Carpet Co.'s Mill, Lowell, Mass.

—John Chadwick, overseer of weaving, has changed from the Metacomet Mills, Fall River, to the Robeson Mills, at Fall River, Mass., succeeding Timothy Mooney.

—A. J. Cobb has left Fairmont, S. C., to accept the position of overseer of spinning with the Mills Mfg. Co., Greenville, S. C.

—Samuel Clay, overseer of the mule spinning department of the Phoenix Cotton Mill, Nashville, Tenn., has resigned and has taken a place in Paducah, Ky.

—C. W. Carter, overseer of weaving of the Dyerville Mfg. Co., Providence, R. I., has resigned. J. E. Briggs, formerly of Eagleville, Conn., and recently with the new Spalding Cotton Mills, Griffin, Ga., has been appointed in his place.

—H. K. Drew, who has been superintendent of a mill at Salem, Mass., is occupying a similar position at the Clinton Mill, Woonsocket, R. I. He succeeds his father, Oliver D. Drew, who resigned to assume the management of the Peabody Manufacturing Co., Newburyport, Mass.

—Charles Franklin, second-hand in the Linwood Cotton Mills at Whitinsville, Mass., has resigned to become overseer of mule spinning at the Sugar River Mills, Newport, N. H.

—L. Fenno has resigned as overseer of spinning at the Glasgo Yarn Mill, Glasgo, Conn., in order to accept a position with the Baltic Power Co., Baltic, Conn.

—M. J. Gordon, overseer of spinning at the Victor Cotton Mill, Rock Hill, S. C., has resigned to accept a position as carder and spinner at the Borden Mill, Goldsboro, N. C.

—C. B. Haynes, superintendent of the East Durham Cotton Mills, Durham, N. C., has tendered his resignation, and will be succeeded to that position by Y. F. Smith, assistant superintendent of the mills.

—Lemuel Hingham, overseer in the mule spinning department of Berkshire Mill No. 2, Adams, Mass., has resigned his position, and will move to North Dakota, where he will begin farming. His health has been seriously affected and he is obliged to give up his present occupation.

—John Humes, of Taunton, has resigned as boss spinner of Harmony Mill, No. 1, Cohoes, N. Y., and gone back to the Canoe River Mills.

—George W. Jackson, formerly overseer in Versailles, succeeds Lewis Fenno at the Glasgo (Conn.) Yarn Mills, as overseer of spinning.

—Joseph Lewin, overseer of weaving at the King Philip Mills, Fall River, Mass., has resigned. He, with his sons, will remove to his farm in Eastern Kansas, and will engage in stock raising and general farming.

—John Morrison has taken a position in the Lawrence Duck Mill, Lawrence, Mass.

—Timothy Mooney, formerly overseer of weaving at the Robeson Mills, Fall River, is now superintendent of the Chadwick's Mills, Chadwick's, N. Y.

—James G. Merriman has succeeded G. H. Sayward as manager of the Standard Yarn Co., Oswego, N. Y. Mr. Sayward will reside in Boston, Mass., hereafter.

—John F. O'Brien, overseer of the cloth room of the Kearney Cotton Mills, Kearney, Neb., has resigned to take a similar position with the Henderson Cotton Mills, Henderson, Ky.

—J. A. Smyth, Jr., has been made buyer of the Pelzer, Mfg. Co., Pelzer, S. C. He has taken his father's, E. A. Smyth place.

—E. H. Shanklin, Jr., has been selected for superintendent of the Easley Cotton Mills, Easley, S. C. He was formerly of the Piedmont Mfg. Co., Piedmont, S. C.

—J. L. Sexton, of Charlotte, N. C., has been chosen president of the Arlington Cotton Mills at Arlington, S. C., O. A. Robbins of Charlotte, N. C., having resigned.

—Charles Sweet, superintendent of the North Scituate Cotton Mills, North Scituate, R. I., has resigned to take charge of a large mill in the South. George H. Bartlett, who was in charge of the establishment about a year ago, will succeed Mr. Sweet.

—David Sunn, overseer of the weaving department for the past twelve years of the Manville Co., Manville, R. I., has resigned.

—John F. Tibbetts has resigned as superintendent of the No. 4 mill at West Warren, Mass., in order to accept a position elsewhere, and has been succeeded by Charles Bragg of New Bedford, Mass.

—C. P. Thompson has been engaged as head spinner by the Easley Cotton Mills, Easley, S. C. Mr. Thompson was formerly of the Piedmont Mfg. Co., Piedmont, S. C.

—Samuel Thayer, master mechanic of the Blackstone Mfg. Co., Blackstone, Mass., has resigned to accept a position in Woonsocket, R. I.

—J. A. Thompson, who recently resigned as overseer in the mills of the Coosa Manufacturing Co., Piedmont, Ala., has accepted the position of boss of the spinning, twisting and spooling departments of the Willingham Cotton Mills, Macon, Ga.

—Richard Thirst, master mechanic at the Lanett Mills, West Point, Ga., has resigned.

—R. A. Williams, for some time overseer of spinning at the Orr Mills, Anderson, S. C., has resigned to accept a similar position with the Monaghan Mills, Greenville, S. C.

—William M. Woods, superintendent of the Natchez Cotton Mills, Natchez, Miss., has resigned to accept a similar position in the McComb City Cotton Mills, McComb City, Miss.

—Fred A. Whitmore recently resigned as assistant general superintendent at the Draper Co.'s works, Hopedale, Mass., to become master mechanic of the Cocheco Mfg. Co., Dover, N. H.

—A. Walker has retired from the superintendency of the mill at Simsbury, Conn., after 32 years of service as superintendent.

—M. C. Withey has resigned as second-hand of carding for the United States Cotton Co., Central Falls, R. I., to accept a position as carder in Centreville, in place of B. A. Webber. Mr. Webber goes to the Social Mill in Woonsocket as carder.

—H. C. Worcester, superintendent of the Attawaugan Co.'s mills at Ballouville, Conn., has become superintendent of the weaving room of the Harmony Mill No. 3, Cohoes, N. Y. He will have charge of about 3000 looms.

—W. S. Howard, overseer of winding at Belding Bros. & Co.'s silk mill at Belding, Mich., has become foreman of spinning in the company's mill at Rockville, Conn.

—James Driver, overseer of spinning at the Bigelow Carpet Co.'s mills, Lowell, Mass., and for thirty years in the employ of that company, died at his residence on Mt. Grove St., in that city, on Saturday, February 9, in his seventy-second year.

—Peter Boutiette, overseer of carding in the Whitinsville Cotton Mills, Whitinsville, Mass., died February 12, from pneumonia. He was 45 years old and a native of Canada.

—William Wallace Gleason, of Dedham, Mass., died early last month. He was born in Waterbury, Vt., April 24, 1821, and was employed for many years in woolen mills. He was overseer of wet finishing in the Glenham (N. Y.) Woolen Mills, in the North Vassalboro (Me.) Woolen Mills, and then accepted a position as superintendent of the finishing department of the Washington Mills at Lawrence, holding this place until he came to Dedham, where for 14 years he had charge of the wet finishing in the Merchants' Woolen Mill.

—John F. Hart, a prominent manufacturer of Racine, Wis., and founder of the Racine Woolen Company, died at Los Angeles, Cal., February 7th. He was much interested in charitable work, during the past few years having given many thousands of dollars for this purpose.

—Jeremiah G. Clark, a well-known citizen of Franklin, N. H., died recently. The deceased was born in Franklin, Oct. 19, 1835. He was engaged in the machine business under the name of Clark & Haynes, and afterwards in the manufactuure of hosiery at Tilton, N. H., building the mill now occupied by G. H. Tilton.

Woolen.

—David Brown, overseer of weaving for James Irving & Son, Chester, Pa., has been promoted to the position of superintendent of those mills.

—Fred Ball, overseer of dressing, spooling and winding at the Ashaway Mills, Ashaway, R. I., has resigned.

—Arthur T. Bright, of Philadelphia, has accepted the superintendency of the Atlanta Woolen Mills, Atlanta, Ga.

—John Codd, formerly of Westerly, R. I., has succeeded William Burdick as boss carder at the Airlie Mills, Hanover, Conn.

—P. H. Coyle, boss spinner, after serving 16 years at the Passaic Woolen Co., Passaic, N. J., has resigned.

—C. M. Cummins, formerly superintendent of the Stoneville Worsted Co.'s mills, Auburn, Mass., has taken a like position in the company's mills at Worcester, Mass.

—W. J. Collins, boss spinner for the Indian Spring Woolen Co., Madison, Me., has resigned to accept a similar position with the Jefferson Manufacturing Co., Jefferson, Mass.

—George Cunliffe, of Pawtucket, R. I., has gone to Mexico, where he has a position as overseer of weaving in a woolen mill there.

—Fred Dowding has resigned his position at the American Mills Company's plant, Rockville, Conn., to become overseer in the dyeing department of a mill in Philadelphia, Pa.

—John Doyle has succeeded Burk Willis as boss weaver at the Glen Woolen Mill, Oakdale, Mass.

—Thomas Evans, formerly of Schofield, Mason & Co.'s mill, Philadelphia, has succeeded Fred Silk as superintendent of the Whittall Carpet Mill, Worcester, Mass.

—Walter Greene has resigned as overseer of finishing for the Davis & Brown Woolen Co., Danielson, Conn., and is superseded by Edward Milner of Stafford Springs.

—E. F. Grant, pattern weaver for F. Glazier & Son, South Glastonbury, Conn., has succeeded his father, the late Eben Grant, as overseer of the twisting and warp dressing departments of the mill.

—M. J. Gahagan, formery with the Oneko Woolen Mills at New Bedford, Mass., is boss carder for the Saxonville Woolen Mills, Saxonville, Mass.

—J. Gallagher has resigned as boss spinner at the Baltic Mills, Enfield, N. H.

—Thomas Hassett, formerly boss carder at the Central woolen Mill, Stafford Springs, Conn., is acting in a like capacity at the Regan Mill, Rockville, Ct.

—W. H. Hubbard is now employed in the weaving department of the West Swanzey Woolen Mill, West Swanzey, N. H.

—James Hall, overseer of carding for the Paton Manufacturing Co., Sherbrooke, P. Q., has resigned in order to accept a similar position with the Assabet Mills of the American Woolen Co., Maynard, Mass., succeeding Frank R. Connor, who recently resigned.

—James Hirst, of Peace Dale, R. I., has succeeded C. T. Dunlevy as overseer of weaving in the Oneko Woolen Mills, New Bedford, Mass. Mr. Dunlevy has gone to the mill of Beckman & Co., Cleveland, O.

—John Harrington, overseer of the wool sorting department of the Lymansville Mill, Lymansville, R. I., has resigned.

—M. C. Jones has recently engaged with the Quinapoxet Woolen Mill, Quinapoxet, Mass., as boss finisher.

—George Legg ,superintendent of the E. D. Thayer Woolen Mills, Cherry Valley, Mass., has resigned and gone into business with his brother, manufacturing cotton worsteds at Providence, R. I.

—C. Loridans, superintendent of the Lafayette Mill, Woonsocket, R. I., has resigned, and has been succeeded by Charles Devine, who will have the entire management of the mill. Mr. Loridans, with Mr. Singleton and Judge Feely will run a worsted mill in Providence.

—Hector Messier, formerly with the Oakdale (R. I.) Worsted Mill, is now boss finisher for Sayles & Gilleran, Woonsocket, R. I.

—Thomas McClintock has severed his connection with the J. J. Regan Manufacturing Co., Rockville, Conn.

—C. Nimo, who has been overseer of weaving in Winooski, Vt., has gone to Lawrence, Mass.

—F. S. Nettleton is now with the Unicorn Mills, Millington, Md., employed as designer.

—William O'Brien, late of the Germania Mills, Holyoke, Mass., has recently accepted the position of boss dyer for Holden, Leonard & Co., Bennington, Vt.

—J. T. Powers has engaged as overseer of weaving in the Ashuelot Woolen Mills, Ashuelot, N. H.

—Herbert Rawnsley, overseer of worsted spinning at the Collingwood Mills, Philadelphia, Pa., has resigned, and is now with the Manhattan Worsted Mills, New York.

—William Stewart, recently employed at Stamford, Conn., has gone to the Middlesex Co., Lowell, Mass., to take charge of the gigging department.

—Frederick Silk, until recently boss dyer at the Whittall Carpet Mills, Worcester, Mass., has taken a similar position with the Bigelow Carpet Company at Lowell, Mass.

—A. E. Shaw, agent of the Campbell Mills, Potter Hill, R. I., has tendered his resignation, and has associated himself with A. D. Ellis, of Monson, and will start one of the mills there.

—S. D. Smith, Jr., of Dorchester, has accepted a position in the E. Frank Lewis Wool Scouring Mill, Lawrence, Mass.

—Henry C. Willis, overseer of weaving for several years past with the Oakland Manufacturing Co., Haight, Md., has accepted a similar position with James Irving & Son, Chester, Pa.

—F. C. Wilson, boss finisher at the Southwark Mills, Philadelphia, Pa., has resigned and engaged in a similar capacity with the Atlanta Woolen Mills, Atlanta, Ga.

—G. A. Westbrooke is now with the Glendale Woolen Mill, Glendale, R. I., as boss dyer.

Knit.

—Joseph Byrnes, formerly employed as overseer of carding by the Faith Knitting Co., Sand Lake, N. Y., is now engaged in that capacity by the Virginia Textile Co., Lynchburg, Va.

—Frank M. Buck has been promoted to boss carder of the Glastonbury (Conn.) Knitting Co.'s No. 2 mill.

—H. D. Buck, of St. Johnsville, N. Y., has recently accepted the superintendency of the new mill at Adrian, Mich., viz., the Adrian Knitting Co.

—Austin Bidwell has resigned as superintendent of the Glastonbury (Conn.) Knitting Co.

—Henry Damp, of Amsterdam, N. Y., has recently accepted the position of boss knitter with the Alpine Knitting Co., Pittston, Pa.

—Samuel Driver, of Pawtucket, R. I., and late of North Vassalboro, Me., has recently engaged with the Gloversville Knitting Co., Gloversville, N. Y., as boss carder and spinner.

—James Farley, of Amsterdam, N. Y., well known finisher, is now with the Capron Knitting Co., Capron, N. Y.

—Frank Fenner, formerly of Little Falls, is now boss finisher in a knitting mill at Mohawk, N. Y.

—H. H. Humphrey, formerly with the Western Knitting Co., Rochester, Mich., is superintendent of the Clinton Knitting Co., at Clinton, Mich., recently incorporated to manufacture gloves, mittens and hosiery, and will buy yarns and do their own dyeing and finishing.

—Edward Kennedy, of York, Pa, has recently engaged with the Elizabeth City Knitting Mills, Elizabeth City, N. C.

—M. D. L. Kelley resigned recently as overseer in Robert MacKinnon's Mill, Little Falls, N. Y., and was presented with a gold watch by his former employes.

—William J. Meacham, foreman of the shipping department, and William Mathers, at the head of the cutting department, in the Valentine Knitting Co.'s mills, Bennington, Vt., have resigned.

—Thomas McCormick, of Cohoes, N. Y., is now with Fuld & Hatch, Albany, N. Y., as overseer of cutting.

—A. L. Patterson, of China Grove, N. C., has been made superintendent of the Windemere Knitting Mill at Albemarle, N. C.

—Elmer J. Tator, Hoboken, N. J., is now with Joseph Simpson's Sons, Toronto, Ontario.

—Henry Taylor of Cohoes, N. Y., has accepted the superintendency of the Himes Knitting Mills, novelty department, in that city.

—Herbert Taylor, a well known woolen and knitting mill superintendent and overseer of carding, has accepted a position with the Utica (N. Y.) Knitting Co.

—H. Watt has accepted the superintendency of the Peterborough (Ont.) Underwear Co.'s mills.

—A. J. Whitehouse, secretary of the Star Knitting Co., Cohoes, N. Y., has been appointed manager to succeed Charles J. Boughton, who accepted a position with the Canadian Woolen Mills at St. Hyacinthe, P. Q., in the knitting department.

Deaths.

—William H. Haile, formerly president of the National Association of Wool Manufacturers, three years lieutenant-governor of Massachusetts, and president of the Haile & Frost Mfg. Co., died at his home in Springfield, Mass., on February 13. Gov. Haile was a familiar figure in Massachusetts affairs, and widely known also beyond the borders of his adopted state. He was born at Chesterfield, N. H., in 1833, and his father, William Haile, was the first Republican governor of the Granite State. The family moved to Hinsdale when he was quite young, and he graduated at the schools there and later from Dartmouth College. After being admitted to the bar and practising law a short time in Boston, he returned to Hinsdale, and became a partner of his father and Mr. Frost under the firm name of Haile, Frost & Co., which afterwards became the Haile & Frost Mfg. Co., of which he was the president. This is one of the oldest wooden concerns in New England, dating back nearly one hundred years. Besides being president of the Haile & Frost Company, Mr. Haile was connected as president and director with a dozen prominent concerns in the western part of the state, and will be missed and mourned by a very large circle of business and social acquaintances.

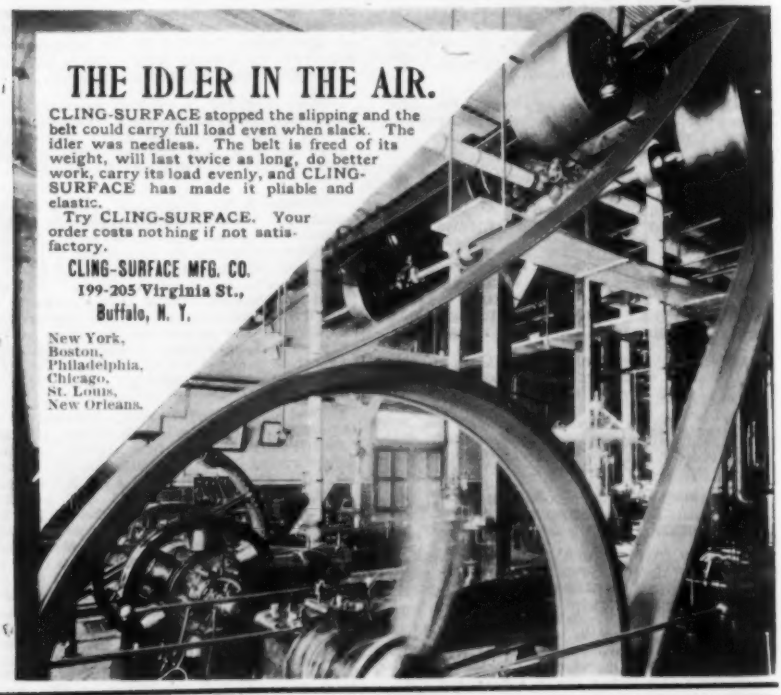
—John Yewdall, a retired worsted manufacturer, of Philadelphia, died recently at his home near that city. For many years he and his brother operated the mills at 25th and Spring Garden Sts.

—Frederick C. Blood, 47, died at his home in Ware, Mass., recently. Mr. Blood was born in Ware, April 1, 1852. He was formerly in the drug business, and also Ware agent for the American Express Co. for several years. He entered the employ of the Otis Company in 1882, as superintendent of its gas works. In 1885 he was appointed foreman of the Otis yard department, in connection with his other duties, which position he held at the time of his death.

—Frank W. Brightman, treasurer of the Stafford Mills, Fall River, Mass., after an illness of five weeks, passed away at his home on Pine Street, March 1st. He was a native of Fall River, and always resided there. His first position was assistant bookkeeper in the Durfee Mills. Then he became connected, at the outset of its career, with the Globe Street Railway Co., of which he was an early treasurer. He maintained his interest in street railroads all his life, having to do with the establishment of lines in the Middle and Western States, and being the first president of the Dartmouth & Westport Street Railway Company. Some ten years ago, Mr. Brightman was elected treasurer of the Stafford Mills, and his success in this field as well as in every other field of enterprise which he entered, is widely known.

—W. H. Bagshaw, a well-known manufacturer of comb circles and worsted specialties, died at his home in Lowell, February 20, at the age of 54. He was of English birth, coming to this country when a young lad, and started his present business in a small way thirty years ago, which has grown to large proportions.

—Leonard K. Weldon, of Amsterdam, died at a New York hospital late last month, while on an eastern business trip, from pneumonia. He had been in the best of health just before starting, and was ill only two days. Mr. Weldon was vice-president and general manager of the Klauder-Weldon Dyeing Machine Co. He was born in Nottingham, Eng., about fifty years ago, and soon after coming to this country took a position with the Green Knitting Co., as boss dyer, and remained with this concern for eight or nine years. During this time he invented a dyeing machine, which was used in the Green Mills first, and about eleven years ago the Klauder-Weldon Machine Co. was formed, the inventions of Messrs. Klauder and Weldon being combined in the construction of a line of labor saving machinery which has made a radical change in dye house methods. Mr. Weldon was an able business man, with a very wide circle of friends among mill men, to whom his sudden death came as a great shock. Mr. Weldon is survived by his wife, three daughters and a son.


THE IDLER IN THE AIR.
CLING-SURFACE stopped the slipping and the belt could carry full load even when slack. The idler was needless. The belt is freed of its weight, will last twice as long, do better work, carry its load evenly, and CLING-SURFACE has made it pliable and elastic.
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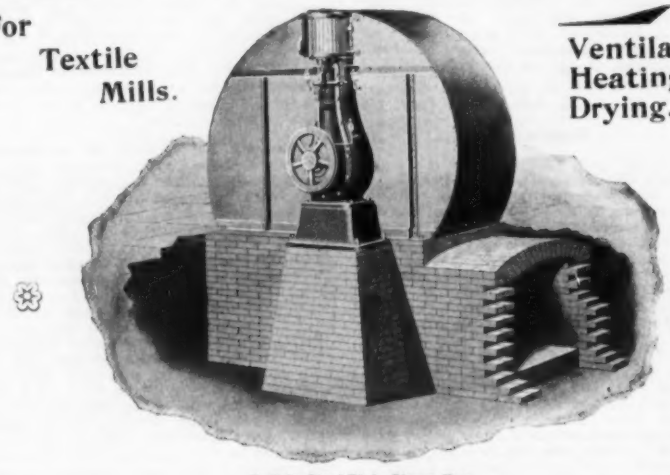
For Textile Mills.

Ventilation, Heating, Drying.



Buffalo Steel Plate Steam Fan.

A positive circulation of air with temperature and humidity under complete control.

Buffalo Forge Company, BUFFALO, N. Y.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Air Moistening Regulator.
Johnson Electric Service Co., 120 Sycamore St., Milwaukee, Wis.

Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.

Appraisals.
American Appraisal Co, Milwaukee, and 804 Park Row Bldg, New York.

Arc Lamps.
Lea Manufacturing Co., Elwood, Indiana.

Architects and Mill Engineers.
Ferguson, John W., Paterson, N. J.
Lockwood Greene & Co., 93 Federal St., Boston, Mass.

Artificial Stone.
Warren Bros. Co., 143 Federal St., Boston.

Asphalting & Asphalt Materials.
Warren Bros. Co , 143 Federal St., Boston.

Asphalt Roofing.
Warren Bros. Co. 143 Federal St., Boston.

Automatic Feeds for Cotton and Wool.
Atlas Foundry & Mch. Co., Newark, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Bailing Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Bands and Labels.
Docker-Foster Co., Phila., Pa.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Boston Belting Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Jeffrey Manufacturing Co., Columbus, Ohio.
Link Belt Machinery Co., Chicago, Ill.
Popham, Henry, & Son, Newark, New Jersey.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Co., 168 Virginia St., Buffalo, N. Y.
Stephenson Mfg. Co., Albany, N. Y.

Belt Hooks.
Bris ol Co., Waterbury, Ct.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Bosson & Lane, Boston.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Block Cutting for Printing.
Smith & Meinken, 427 West 13th St., New York.

Blowers.
American Blower Co., Detroit, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant, B. F. Co., Boston, Mass.

Bobbins, Spools, Shuttles, Etc.
Murray, C. O., Nashua, N. H
Parker, Henry Co, Springfield, Vt.
Southern Bobbin Co., Greensboro, N. C.
Sweet & Doyle, Cohoes, N. Y.
Tebbets, E. L., & Co., Locke's Mill, Me.

Boilers.
See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Braiding Machinery.
New England Butt Co. Providence, R. I.
Thun & Janssen, Reading, Pa.

Braids.
See Tapes, Braids and Edgings.

Brass (Perforated.)
See under Perforated Metal.

Bridges.
American Bridge Co., The, New York.

Brushes.
Felton, S. A. & Son Co., Manchester, N. H.
Jacobus, A. G. Verona, N. J.
Warner, Wm. E. & Co., 136 Center St., New York.

Brushers
See Napping Machines.

Buildings (Steel).
American Bridge Co., The, New York.

Burr Pickers.
Atlas Foundry & Mch. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Calico Printers' Machinery and Supplies.
Arlington Machine Works, (Arthur Birch) Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W., Sons & Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.
Taunton New Bedford Copper Co., New Bedford, Mass.
Rusden Machine Co., Warren, R. I.
See also Dyeing, Bleaching Machinery, etc.

Card Clothing.
Ashworth, Elijah, Fall Biver, Mass.
Booth, Benj. & Co., Philadelphia.
Buck Card Clothing Co., Palmer, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Card Grinding Machinery.
Hardy Machine Co., Biddeford, Me.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.

Carpet Machinery.
Altemus, W. W. & Son, 2816 N. 4th St, Phila. Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Cement "Dealers."
Warren Bros. Co , 143 Federal St., Boston.

Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Cling Surface.
Cling Surface Mfg. Co., Buffalo, N Y.

Clocks.
Howard, E. Clock Co., Marlboro Building, Boston.

Clutches.
American Tool & Machine Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., The, New Haven, Conn.
Hunter, James, Machine Co., North Adams, Mass.

Color Finding Device.
Chromatic Device Co., Brooklyn, N.Y.

Combs (Wool and Cotton)
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants (Dry Goods, Knit Goods).
Doane, Thomas H., 233 Monroe St., Chicago, Ill.
Southern Import & Commission Co., Greensboro, N. C.
Wagner, M. & Co., 213 Ninth St., Pittsburg Pa.

Compressors.
Worcester Warp Compressing Machine Co. Worcester, Mass.

Concrete.
Warren Bros. Co., 143 Federal St , Boston.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co., Columbus, O.
Link Belt Machines Co., Chicago, Ill.

Copper (Perforated.)
See under Perforated Metal.

Copper Print Rollers.
Phillips Co, The Thomas, Providence, R. I.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.

Corrugated Iron Shutters.
American Bridge Co., New York.

Cotton Elevators.
Buffalo Forge Co., Buffalo, N. Y.
Link Belt Machinery Co., Chicago Ill.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
American Loom Co., Readville, Mass.
Ashworth, Elijah, Fall River, Mass.
Atherton, A. T., Machine Co., Pawtucket, R. I.
Barber & Coleman, 504 Sears Bldg., Boston.
Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Fall River Machine Co., Fall River, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co., Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lever, Oswald, Lehigh Ave. and Masher St., Philadelphia.
Lowe, Stephen C., 186 Devonshire St., Boston, Agt. John Hetherington & Sons. Ltd.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G & Co., Boston, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.
Schofield, Geo. L., Philadelphia.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.
Worcester Warp Compressing Machine Co., Worcester, Mass.

Cotton Openers and Lappers.
Atherton, A. T., Machine Co., Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.

Cotton Waste.
Charles, W. B., Amsterdam, N. Y.

Credits.
National Mercantile Agency, New York and Boston.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Decoration Wash for Interiors.
Moore, Benj. & Co., Brooklyn, N. Y.

Designer.
Hendry, T., 406 W. 36th St., N. Y.

Dextrine.
Stein, Hirah & Co, 165 Duane St., New York.

Dryers.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Hunter, Jas., Machine Co., No. Adams Mass.
Kenyon, D. R. & Son., Raritan, N. J.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dyers, Bleachers and Finishers.
American Yarn Printing Works, 134-136 North 22d St., Philadelphia.
Brophy's, T, Sons, Jasper St, Philadelphia
Capstick, John & Sons, Montville, N. J.
Cohoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Davidson & Brooke, 2360 No. 3rd St., Philadelphia.
Duncan & Baillie, Cohoes, N. Y.
Fidelity Finishing Works, Philadelphia, Pa.
Firth & Foster Co, Kensington, Pa.
Franklin Bleaching & Finishing Works, Ltd., 70th St., and Haverford Ave., Phila.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Lorimers, The Wm. H. & Sons Co., Phila.
Molt Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Pond Lily Co., New Haven, Ct.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Antisdel, E. M., 12 Miller St., Utica, N. Y., (Knit Dryer.)
Barnesville Mfg. Co., Barnesville, Ga.
Birch Bros., Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W, & Sons Co Phila Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Delahunty Dyeing Machine Co., Pittston, Pa.
Dubois, A. N., 2170 Ledgely Ave., Philadelphia, Pa. (Black for Hosiery.)
Fairmount Machine Co, 22 and Wood Sts. Philadelphia.
Frank's Wagon Works, 2731 N. 6th St., Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, Machine Works, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Knapp, C. H., Paterson, N. J.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Webendorfer & Walling, Paterson, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dyehouse Floors.
Warren Bros., 143 Federal St., Boston.

Dye Sticks.
Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M., Philadelphia, Pa.
Dyestuffs and Chemicals.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Atteaux, F. R. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston.
Dillon & Co. 20 Cedar St, New York.
Dubois, A. N., 2170 Ledgely Ave., Phila., Pa.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y
Johnson, Wm. G, & Co, Uncasville, Conn.
Jones, J. Howell, 18 Burling Slip, New York.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.
Matheson, W. J, & Co, 182-184 Front St, N.Y.
Molt Bros., Millbury, Mass. (Indigo Blue.)
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Read, Holliday & Sons, Ltd., 7 Platt St. New York.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Schoellkopf, Hartford & Hanna Co., Philadelphia.
Sharpless Dye Wood Ext. Co, The Bourse, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Sykes & Street, 85 Water St, N. Y.
Thayer, Ed. M., 106 Broad St., Boston, Mass.
Vila, H. S., 115 So. 2nd St., Philadelphia, Pa.
Dynamos.
General Electric Co., 44 Broad St., New York
Sturtevant, Co., B. F. Boston.
Edgings.
See Tapes, Braids and Edgings.
Elastic Web Calendering Machines.
Knapp, C. H., Paterson, N. J.
Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.
Elevators.
Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven Conn.
Jeffrey Manufacturing Co., Columbus, O.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Electrical Construction.
General Electric Co., 44 Broad St., New York.
Philadelphia Electric Construction Co., Philadelphia.
Electric Fans.
Buffalo Forge Co., Buffalo, N. Y.
General Electric Co., 44 Broad St., New York.
Sturtevant Co., B. F., Boston.
Electric Lighting.
General Electric Co., 44 Broad St., New York.
Electric Motors.
General Electric Co., 44 Broad St., New York.
Sturtevant Co., B. F., Boston.
Engine Foundations.
Warren Bros. Co., 143 Federal St., Boston.
Engineers, Mechanical.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.
Exhaust Heads.
Burt Manufacturing Co , Akron, Ohio.
Fans—Exhaust and Ventilating.
See Ventilating Apparatus.
Feed Water Heaters.
Green Fuel Economizer Co., Matteawan, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.
Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.
Filters.
Scaife, W. B. & Sons, Pittsburg, Pa.
Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.
Fireproof Construction.
American Bridge Co., The, New York.
Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.
Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.
Friction Clutches.
See Clutches.
Friction Hoisting Drums.
Eastern Machinery Co., New Haven, Conn.
Fuel Economizers.
Green Fuel Economizer Co., Matteawan, N. Y.
Fulling Mills for Woolen Goods.
Frank's Wagon Works, 2731 N. 6th St., Philadelph a.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.
Kenyon, D. R. & Son, Raritan, N. J.
Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.
Gas Exhausters.
Sturtevant Co., B. F., Boston.
Gears.
New Process Raw Hide Co., Syracuse, N. Y.
Gear Cutting Machine.
Whiton, The D. E, Co, New London, Conn.
Generating Sets.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F , Boston.
Grate Bars.
U. S. Rocking Grate Bar Co., Elizabeth, N.J.
Heating.
See Ventilating.
Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.
Hoisting Machinery.
The Eastern Machinery Co., New Haven, Conn.
Hose.
Boston Belting Co., Boston.
Hosiery Labels.
Decker, Foster Co., Philadelphia, Pa.
Hosiery Boards.
Pearson, J. T, Kensington, Pa.
Humidifying Apparatus.
American Air Moistening Co., Boston.
Johnson Electric Service Co., 120 Sycamore St., Milwaukee, Wis.
Humidiostat.
Johnson Electric Service Co., 120 Sycamore St., Milwaukee, Wis.
Hydro Extractors.
American Tool & Machine Co , Boston.
Rusden Machine Co., Warren, R. I.
Knit Goods Edgings, Trimmings, etc.
Cathcart, John & Co., 115 Franklin St., New York.
Charles, W, B., Amsterdam, N. Y.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Fleming & Chapin, Philadelphia
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Kavanaugh, Geo. W., Cohoes, N. Y.
Krout & Fite Mfg. Co, Allegheny Ave. and Emerald St., Phila.
Schneebeli, G. A. & Co., Nazareth, Penn.
Weimar Bros, 1817 East York St, Phila. Pa.
Knit Goods Finishing Machines, Crochet, Etc.
Industrial Mfg. Co., Camden, N J.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.
Willcox & Gibbs Sewing Mch. Co., New York.
Knitting Machine Cylinders.
Lindley, G. W., 5122 Wakefield St., Germantown, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.
Knitting Machinery.
American Knitting Machine Co., 6th and Arch St., Philadelphia, Pa.

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PREVENTS BELT SLIPPING
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You run no risk.

Order a case (125 sq. ft.) on 30 days trial, at $12.00, less carrying charges.

No pay is expected if not found as represented.

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34 Jackson St., Chicago, Ill.

Antisdel, E. M., 12 Miller St., Utica, N. Y.
Beattie, Wm. & Son, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co., 40 N. 7th St., Phila.
Lamb Knitting Mach. Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Lindley, Geo. W., 5122 Wakefield St., Germantown, Pa.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, Arthur, 760 Lexington Avenue., Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co., Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.
Tompkins Bros., Troy, N. Y.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co , Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Kavanaugh, Geo. W., Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co., 40 N. 7th St., Philadelphia.
Lamb Knitting Machine Mfg. Co., Chicopee Falls, Mass.
Lydall, H, & Foulds, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Knotter for Spoolers.
Barber & Coleman, 504 Sears Bldg., Boston.

Laboratory Outfits.
Bullock & Crenshaw, 828 Arch St. Phila, Pa

Looms.
American Loom Co., Readville, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A., & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St , Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Pickers.
Loom Picker Co., Biddeford, Me.

Lubricators.
Ameledema Oilless Bearing Co., Berkeley St., Wayne Junction, Philadelphia.
Dixon, Jos., Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia.

Machinists' Tools.
Dodge Mfg Co., Mishawaka, Ind.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Mechanical Draft.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 544 Hermon St, Worcester Mass.
Fabric Measuring & Packaging Co., Postal Telegraph Bldg , New York.

Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
Rusden Machine Co., Warren, R. I.

Mill Brushes.
See Brushes.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Dixon Lubricating Saddle Co., Bristol, R.I.
Dodge Mfg. Co., Mishawaka, Ind.
Easton-Burnham Co., Pawtucket, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
National Supply Co., Paterson, N. J.
Southern Bobbin Co., Greensboro, N. C.
Sweet & Doyle, Cohoes, N. Y

Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass.
Ardrey, S. B, & Sons, Bristol, Pa.
Columbia Napping Machine Co., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.

Noils (Silk.)
Ryle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

Non-Shrinking Process for Wool.
Haigh, Frederic, 660 E. 23rd St., Paterson, N. J.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.

Packing.
Boston Belting Co , Boston.
Jenkins Bros., New York.

Paint.
Moore, Benj. & Co, Brooklyn, N. Y.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.
Crosby & Gregory, 24 School St, Boston, Mass.
Siggers, E. G., Washington, D. C.
Wolhaupter, D. P., Equitable Bldg., Washton, D. C.

Pavers & Paving Materials.
Warren Bros. Co., 143 Federal St., Boston.

Perforated Metal.
American Perforated Metal Co., 171 Wooster St., New York.
Beckley, A. J. & Co., Garwood, N. J.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.
Southern Bobbin Co., Greensboro, N. C.

Pipe Covering.
Keasby, R. A. 83 Warren St, New York.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Ameledema Oilless Bearing Co, 149 West Berkley St, Wayne Junction, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co, Fall River, Mass.
Lambeth Rope Corporation, New Bedford, Mass.
Link Belt Machinery Co, Chicago, Ill.
Rusden Machine Co., Warren, R. I.
Saginaw Manufacturing Co., Saginaw, Mich.

Preparatory Machinery, (Cotton).
Atherton, A. T., Mach. Co., Pawtucket, R. I.
Howard & Bullough Am. Machine Co., Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.

Presses.
Boomer & Boschert Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Printers (Fabrics and Yarn.)
American Yarn Printing Works, Philadelphia.

Pulleys.
See Power Transmitting Machinery.

Pulley Covers.
Acme Pulley Covering Co., 1 West 103rd St., New York.
Vacuum Cement & Pulley Covering Co., 1493 Third Ave., New York.
Warren Mfg. Co., Chicago, Ill.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Purifying & Filtration Plants.
Scaife, W. B. & Sons, Pittsburg, Pa.

Quills.
Parker, Henry Co, Springfield, Vt.

Raw Hide Gears.
New Process Raw Hide Co. Syracuse, N. Y.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Loom Picker Co., Biddeford, Me.
Waider, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Ring Travellers.
National Ring Traveller Co., Providence, R. I.
Morley Button Mfg. Co., Boston.

Roofing Asphalt.
Warren Bros. Co., 143 Federal St., Boston.

Roofing, Gravel, Slag and Composition.
Eastern Granite Roofing Co., Jersey City N J

Roofing Materials (Manufacturers).
Warren Bros. Co., 143 Federal St., Boston.

Rope Transmission.
American Mfg. Co., New York.
Dodge Mfg. Co , Mishawaka, Ind.
Lambeth Rope Corporation, New Bedford, Mass'l
Link Belt Mfg. Co., Chicago, Ill.

Roving Cans.
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 980 Manton Ave. Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford, Mass.

Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.

Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I.

Scales
Sweet & Doyle, Cohoes, N. Y.

Schools.
American Correspondence School of Textile, New Bedford, Mass.
French Textile School, Atlanta, Ga.
Georgia School of Technology, Atlanta, Ga.
Lee's College, Charlotte, N. C.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)
See under Perforated Metal.

Selling Agents.
See Commission Merchants.

Separators.
Ring Frame Thread Protector Co., The, Amsterdam, N. Y.
Draper Co , The, Hopedale, Mass.

Sewing Machines and Supplies.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Excelsior Sewing Machine Co., Philadelphia.
Industrial Mfg. Co., Camden, N. J.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Rusden Machine Co., Warren, R. I.
Union Button Sewing Mch. Co., 164 High St., Boston.
Willcox & Gibbs S. M. Co., New York.

Shafting Hangers, Etc.
See Power Transmission Machinery.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.

Knapp, C. H., Paterson, N. J.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H , Paterson, N. J.
Rusden Machine Co., Warren, R. I.

Sizing, Starch and Gums.
Stein, Hirsch & Co, 165 Duane St, New York.

Sky Lights.
Drouve, The G. Co., Bridgeport, Ct.
Merchant & Co., Philadelphia, Pa.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips The Thomas, Co., Providence, R.I.

Soaps.
India Alkali Works, Boston, Mass.

Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Ward & Undergrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
N. E. Ventilating & Heating Co, 980 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Frames for Wool
Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Spools. *See Bobbins, Spools Shuttles, Etc.*

Spool Cotton for Mfrs. Use.
Standard Thread Co., New York.
Warren, W. Thread Works, Westfield, Mass.

Spooler Knotter.
Barber & Coleman, 504 Sears Bldg., Boston.

Sprinklers
International Sprinkler Co., Philadelphia, Pa.

Stamps for Hosiery.
Smith & Meinken, New York.
Wells, Wilfred, 505 W. Lehigh Ave., Philadelphia.

Steam Boilers.
Babcock & Wilcox Co., The, 29 Cortland St., New York City.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Engines.
American Blower Co., Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Rentschler Co, Hamilton, O.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. & Co., Boston.

Steam Surface Coverings.
Keasbey, Robert A., New York.

Steam Specialties.
Butterworth, H. W. Sons Co., Philadelphia.
Rusden Machine Co., Warren, R. I.
Jenkins Bros., New York
Sturtevant Co., B F., Boston.
U. S. Rocking Grate Bar Co., Elizabeth, N.J.

Steam Valves.
Jenkins Bros., New York.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Cypress Lumber Co, Apalachicola, Fla.
Lewis, H. F. & Co., New Orleans, La.
Rusden Machine Co., Warren, R. I.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa.

Tapes, Braids and Edgings.
Cathcart, John, & Co, 115 Franklin St, N. Y
Fleming & Chapin, Philadelphia.
Friedberger Mfg. Co, Germantown, Pa.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Schneebeli, G. A. & Co., Nazareth, Pa.
Weimar Bros, 1317 East York St, Phila, Pa.

Telephones.
Mianus Electric Co., Mianus, Conn.
Philadelphia Electric Construction Co., Philadelphia.
Plummer, F. O. 620 Atlantic Ave., Boston.

Temples.
American Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.

Tension Pulleys.
Ameledema Oilless Bearing Co., Wayne, Junc., Phila. Pa.
N. E. Ventilating & Heating Co, 980 Manton Ave, Providence, R. I.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tenter Clips.
See Dyeing, Drying, Bleaching and Finishing Machinery.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Textile Schools.
See Schools.

Thread Protectors.
Ring Frame Thread Protector Co., The, Amsterdam, N. Y.

Tom Tom.
Frank's Wagon Works, 2731 N, 6th St., Philadelphia.

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.

Tower Clocks.
Howard, E. Clock Co., Marlboro Building, Boston.

Transmitter for Sewing Machine.
Allen & Overrocker, 2427 Mascher st., Phila.

Trimmers.
Excelsior Sewing Machine Co., Philadelphia.

Turbines.
(See Water Wheels.)

Valves—Rubber.
Boston Belting Co., Boston, Mass.

Ventilating Apparatus.
Allington & Curtis Mfg. Co., Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston.
American Blower Co., Detroit, Mich.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Drouve, The G. C ., Bridgeport, Ct.
National Pancoast Ventilator Co., Philadelphia, Pa.
New England Ventilating & Heating Co, Providence. R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.
Wing, L. J. Mfg. Co., 95 Liberty St., N. Y.

Wall Whitening.
Moore, Benj. & Co, Brooklyn, N. Y.

Warp Stop Motions.
Am. Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.

Washers (Cloth).
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kenyon, D. R., & Son, Raritan, N. J.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co , Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Watchman's Clocks.
Am. Watchman's Time Detector Co., Broadway, N. Y.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Howard, E. Clock Co., Marlboro Building, Boston.
Nanz & Co, 127 Duane St., New York.
Philadelphia Electric Construction Co., 1328 Chestnut St., Philadelphia.

Waterproof Floors.
Warren Bros. Co., 143 Federal St., Boston.

Water Purifiers & Filters.
Scaife, W. B. & Sons, Pittsburg, Pa.

Water Wheels.
Alcott, T. C., & Son, Mt. Holly, N. J.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.

Winders. (Back.)
Taylor, Jas., 835 Arch St., Philadelphia.

Winder Bobbins
Sweet & Dovle, Cohoes, N. Y.

Winders. (Hosiery.)
Foster Machine Co., Westfield, Mass.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia.
Universal Winding Co, 95 South Street, Boston.

Wood Pulleys.
Dodge Mfg Co., Mishawaka, Ind.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool Cleaning Compound.
India Alkali Works, Boston.

Wool Combing Machinery.
Leigh, Evan A. 35 Mason Bldg., Boston.

Wool and Waste Dusters.
Atlas Foundry and Mch. Co., Newark, N. J.
Gerry, Geo, & Son. Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.

Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2816 N. 4th St, Phila, Pa.
American Tool and Machine Co., Boston.
Arlington Mch. Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks., Newark, N.J.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1788 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed. & Bro, 28 Strawberry St, Phila, Pa.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia, Pa.
Lowe, Stephen C., 186 Devonshire St., Boston. Agt. John Hetherington & Sons, Ltd.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Schofield, Geo. L., Philadelphia.
Woonsocket Machine & Press Co Woonsocket, R. I.
Worcester Warp Compressing Machine Co. Worcester, Mass.

Wool Shoddies.
Slack, Wm. H. B., & Bro, Springfield, Vt.

Wool Washing, Preparing and Drying Machinery.
Hunter, Jas. Machine Co., No. Adams, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

YARNS, THREADS, ETC.

Banding.
Lambeth Rope Corp., New Bedford, Mass.
Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.
American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Argo Mills Co., 216 Chestnut St., Phila, Pa.
Barnesville, Mfg. Co., Barnesville Ga.
Buckingham & Paulson, 83 Leonard St., New York.
Catlin & Co, New York and Boston.
Charles, W. B., Amsterdam, N. Y.
Colchester Mills, 346 Broadway, New York.
Dana Warp Mills, Westbrook Me.
Dexter Yarn Co., Pawtucket, R. I.
Dodds, J. S., 517 Wool Exchange, New York.
Eddy & Street, Providence, R. I.
Spring St., N. Y.
Eichmann & Sternberg, New York.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Morgan, E. A. 54 Franklin St., N. Y.
New England Cotton Yarn Co, New Bedford, Mass.
Orswell Mills, Fitchburg, Mass
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Flax. Hemp. Jute and Ramie.
Fawcett, Hughes, 115 Franklin St., N. Y
Eichmann & Sternberg, 530 Broadway, N. Y.
Morgan, E. A., 54 Franklin St., N. Y.

Gassed Yarns.
Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, New York.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
New England Cotton Yarn Co, New Bedford, Mass.

Glazed Yarns.
Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Lorimers, Wm. H. & Sons Co., Philadelphia.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Morgan, E. A., 54 Franklin St., N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twine.
Cranston Worsted Mills, Bristol, R. I.
Eichmann & Sternberg, 530 Broadway, N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Morgan, E. A., 54 Franklin St., N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.
Argo Mills Co., 216 Chestnut St., Phila., Pa.
Barnesville Mfg Co., Barnesville, Ga.
Boyer, B. F. & Co, Camden, N. J.
Colchester Mills, 346 Broadway, New York.
Cranston Worsted Mills, Bristol, R. I.
Dexter Yarn Co., Pawtucket, R. I.

ARGO MILLS COMPANY,

HIGH GRADE KNITTING YARNS.

Carded, Combed, Egyptian, American.

Cops, Skein, Cones, Warps,

216 Chestnut St., Philadelphia, Pa.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic, Mass.
New England Cotton Yarn Co., New Bedford, Mass.
Orswell Mills, Fitchburg, Mass.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co. N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

Mercerized Yarns.

Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Lorimer, Wm. H. & Sons Co , Philadelphia.
Montgomery, J. R. & Co., Windsor Locks, Conn.
Morgan, E. A., 54 Franklin St., N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

Mohair Yarns.

Cranston Worsted Mills, Bristol, R. I.
Goff, D. & Sons, Pawtucket, R. I
Skerry, A. T. & Co., 47 Leonard St., N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, 530 Broadway, New York.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard, St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, New York.
Magid Hope Silk Mfg. Co., Milford, Mass.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, Camden, N. J.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket, R. I.
Skerry, A. T. & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Boyer, B. F, & Co, Camden, N. J.
Campion, Richard, 17 Bank St., Philadelphia.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Goff, D. & Sons, Pawtucket, R. I.
Pocasset Worsted Co., Thornton, R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Alphabetical Index to Advertisements.

	page
Acme Pulley Covering Co.	561
Alcott, T. C. & Son	440
Alexander Bros.,	437
Allegheny Worsted Mills,	573
Allen & Overrocker	605
Allington & Curtis . Outside Back Cover	
Altemus, W. W. & Son,	424
Ameledema Oilless Bearing Co,	434
American Appraisal Co.,	554
American Blower Co	607
American Bridge Co.,	430
American Correspondence School of Textiles,	567
American Cotton Yarn Exchange,	567
American Knitting Machine Co.,	596
American Loom Co., The,	423
American Mfg. Co.,	446
American Moistening Co.	566
American Napping Machine Co.,	591
American Perforated Metal Co.	438
American Supply Co.,	424
American Tool and Machine Company	585
Am. Watchman's Time Detector Co.	439
American Yarn Printing Works	602
Anchor Color Mfg. Co,	581
Antisdel, E. M.	601
Ardrey, S. B, & Sons,	602
Argo Mills Co.,	550
Arlington Mach. Works (Arthur Birch),	584
Ashworth, Elijah,	427
Atlas Foundry Mch. Co.,	432
Atherton Machine Co., The A. T.	423
Atteaux, F. E. & Co.	578
Babcock & Wilcox Co., The,	441
Bailey, Frank	588
Bamford & Smith,	592
Barber & Coleman	427
Barnesville Mfg. Co.	567
Beattie, Wm. & Son	604
Beckley, A. J. & Co.	438
Berlin Aniline Works,	581
Berry, A. Hun,	588
Birch Bros.	420-584
Bischoff, C., & Co.,	581
Boomer & Boschert Press Co.	561
Booth, Benj. Co.	427
Bosson & Lane,	582
Boston Belting Co.,	440
Boyer, B. F, & Co,	572
Branson Machine Co,	596
Breedon Sons, Wm.,	603
Bristol Co., The . Outside Back Cover.	
Brophy's, T, Sons	573
Brown, C. H, & Co, Outside Back Cover.	
Brown, W. H,	434
Buck Card Clothing Co.	427
Buckingham, Paulson & Co.,	568
Buckley's Benj., Son,	550
Buffalo Forge Co.	542
Burt Mfg. Co.	554
Butterworth H. W. & Sons Co.,	499
Caldwell, W. E. Co.	588
Campbell & Clute,	602
Campion, Richard,	571
Cathcart, John & Co.	604
Catlin & Co,	569
Charles, William B.	568
Cheney Bros,	573
Cling Surface Co.	542
Cohoes Foundry & Machine Co.,	435
Colchester Mills,	568
Columbia Napping Machine Co.	591
Cooper, Chas,	602
Corey, S. J.,	580
Corey, Wm., Co.,	603
Crabb, Wm, & Co,	437
Crane Mfg. Co.,	602
Cranston Worsted Mills,	572
Crawford, J. J. & Son.,	606
Croft, Howland, Sons & Co,	572
Crosby & Gregory,	445
Curtis & Marble Machine Co.,	592

	page
Cypress Lumber Co,	586
Dana Warp Mills	566
Davidson & Brooke	574
Delahunty Dyeing Mch. Co.	585
Denny, R. B.	552
Dexter Yarn Co.,	568
Dillon & Co,	581
Dixon, Jos., Crucible Co.,	435
Dixon Lubricating Saddle Co.	424
Doane, Thomas H.	559
Docker-Foster Co.	599
Dodge Manufacturing Co.	425
Dodge Needle Co.	—
Dodds, J. S.	568
Drouve Co., The G.	439
Draper Company	411
Dubois, A. N.	560
Duncan & Baillie,	574
Eastern Granite Roofing Co.	439
Eastern Machinery Co.	441
Easton-Burnham Co.,	592
Eco Magneto Clock Co,	439
Eddy & Street,	569
Eichmann & Sternberg,	568
Elliot & Hall,	426
Excelsior Knitting Machine Mfg. Co,	596
Excelsior Sewing Machine Co.,	602
Fabric Measuring and Packaging Co.	428
Fairmount Machine Co,	422
Farbenfabriken of Elberfeld Company,	577
Fawcett, Hughes,	569
Felton, S. A. & Son Co.,	424
Ferguson, John W., Outside Back Cover	
Fidelity Finishing Works	575
Firth & Foster Co	575
Fleming & Chapin	604
Foster, E. H. & Co.	603
Foster Machine Co.	419
Franklin Bleaching & Finishing Works	575
Frank's Wagon Works	584
Friedberger Mfg. Co.	595
Fuel Economizer Co., The	434
Furbush, M. A. & Son Machine Co.	446
Geisenheimer & Co. Outside Back Cover.	
General Electric Co.,	441
Georgia School of Technology	587
Gerry, Geo. & Son,	—
Goff, D. & Sons	562
Goulds Mfg. Co,	—
Granger Foundry & Machine Co., Inside Front Cover.	
Grant Yarn Co.,	569
Greene & Daniels Mfg. Co.,	564
Greenwood, R., & Bault,	574
Haedrich E. M.	583
Haigh, Frederic.,	392
Hardy Machine Co.,	592
Hart, Chas.	606
Hartford Steam Boiler Inspection & Insurance Co.,	438
Henderson, G. K.	435
Hendry, T.	436
Hepner & Horwitz,	568
Hill, James Mfg Co.,	433
Home Bleach & Dye Works,	574
Hopkins Mch. Works,	592
Hooven, Owens & Rentschler Co,	—
Howard, E. Clock Co.	561
Howard, Geo. C.,	433-592
Howard & Bullough Am. Machine Co.,	413
Hunter, Jas, Machine Co,	588
Hunt, Rodney, Machine Co,	589
Hyde, Edward S.,	564
India Alkali Works,	438
Indian Orchard Co.	564
Industrial Manufacturing Co.,	605
International Sprinkler Co.,	—
Ives, Loyal T.	603
Jacobus, Austin G.	426
Janney, O. S., & Co.,	582
Jefferson, Edw, & Bro.,	554
Jeffrey Mfg. Co.	561

	page
Jenckes, E., Mfg. Co.,	593-568
Jenkins Bros., Outside Back Cover.	
Johnson, Chas. A., & Co.,	438
Johnson Electric Service Co.	553
Johnson, Wm. G, & Co.	578
Jones, J. Howell	581
Jones, Lewis	600
Kavanaugh, Geo. W.	604
Keasbey, Robert A. Outside Back Cover.	
Keller, John J., & Co.,	579
Kennedy, Thos.	600
Kenyon, D. R. & Son,	590
Keystone Knitting Machine Mfg. Co.	603
Kilburn, Lincoln & Co.,	423
Kitson Machine Co.	415
Klipstein, A. & Co., Outside Back Cover.	582
Klauder-Weldon Dyeing Machine Co.	591
Knapp, C. H.	434
Koechl, Victor, & Co,	576
Krout & Fite Mfg. Co.,	604
Kuttroff, Pickhardt & Co.	444
Lamb Knitting Machine Co.	601
Lambeth Rope Co., Outside Back Cover.	
Laminar Fibre Co.,	433
Lea Electric Mfg. Co.,	437
Lee's College	561
Leffel, James, & Co,	440
Leigh, Evan Arthur,	424
Leighton Mch. Co.,	598
Lever, Oswald	428
Lewis, H. F. & Co., Ltd.,	592
Lincoln, The, Co.	5?4
Lindley, Geo. W.	601
Link Belt Machinery Co.,	431
Lockwood, Greene & Co.	423
Loom Picker Co.,	432
Lorimer's, Wm. H. Sons Co.,	574
Lowe, S. C.	417
Lowell Machine Shop,	410
Lowell Textile School,	587
Lydall, H., & Fouids,	603
Magid Hope Silk Mfg. Co	573
Malcolm Mills Co.,	572
Manufacturers' Supplies Co.	603
Mason Machine Wks.,	412
Matheson, & Co., Wm. J.,	577
Mayo Knitting Machine & Needle Co,	599
McKerrow, H. G.	416
McMichael & Wildman Mfg. Co,	594
Merchant & Co.	4?6
Merrow Machine Co.,	604
Mianus Elec. Co.,	439
Mitchell Jas. E., & Co.,	569
Molt Bros.	578
Montgomery, J. R., Co.,	566
Monument Mills,	567
Moore, Benjamin & Co.,	437
Moore, C., & Co.,	571
Morgan, E. A.	569
Morley Button Mfg. Co.,	420
Mueller, A.	602
Murray, C. O.	437
Nanz & Co,	433
National Mercantile Agency	559
National Mill Supply Co.	561
National Pancoast Ventilator Co.	438
National Ring Traveler Co., The	420
New England Butt Co.,	606
New England Cotton Yarn Co	565
New England Ventilating & Heating Co.,	583
New Process Raw Hide Co.,	437
N. Y. & Boston Dyewood Co,	592
Nye & Tredick,	594
Oakes Mfg. Co,	578
Orswell Mills,	566
Page Needle Co.,	603
Parker, Henry Co.	427
Parks & Woolson Mch Co.	592
Pawtucket Dyeing & Bleaching Co.	574
Paxton & O'Neill,	600
Pearson, J.T.,	600
Pepper Mfg. Co.,	598
Philadelphia Drying Machinery Co.	422
Philadelphia Electric Construction Co.	429
Philadelphia Textile Machinery Co.,	421-583
Philadelphia Textile School,	587

	page
Phila. Textile Specialty Co.	584
Phillips, The Thomas, Co,	608
Plummer, F. O,	439
Pocasset Worsted Co.,	562
Pond Lily Co., The	575
Popham, Henry & Son	437
Potts, Stacy,	599
Quilter, James H,	606
Ring Frame Thread Protector Co.,	423
Roy, B. S	—
Roessler & Hasslacher Chemical Co,	576
Rowland, Sam'l	574
Rusden Mch. Co.,	442
Ryle, William, & Co.,	573
Saco & Pettee Machine Shops,	423
Saginaw Mfg. Co.	586
Sargent's, C. G., Sons,	432
Scaife, W. B. & Sons	440
Schofield, Geo. L.	554
Schoellkopf, Hartford & Hanna Co.,	579
Schneebeli, G. A. & Co.,	570
Scott & Williams	600
Sharpless Dyewood Extract Co.,	578
Siggers, E. G.	445
Skerry, A. T, & Co,	571
Slack, Wm. H. H. & Bro.	593
Smith & Meinken	433
Snyder, Homer P. Mfg. Co.	601
Solis, Andrew J. Jr., & Co.,	572
Southern Bobbin Co.	433
Southern Import & Com. Co.	559
Southern Railway	606
Stafford & Holt,	597
Stamford Mfg. Co.,	580
Standard Thread Co.,	564
Stearns, A. T, Lumber Co,	586
Stein, Hirsch & Co.,	581
Stephenson Mfg. Co.,	608
Sturtevant, B. F. Co., Inside Back Cover	
Sweet & Doyle	429
Sykes & Street,	580
Taunton-New Bedford Copper Co.,	583
Taylor, Jas.	597
Tebbets, E. L. & Co.,	437
Thayer, Edward M.	578
Thun & Janssen	603
Thurston, A. G. & Son,	435
Tompkins Bros.	602
Torrance Mfg. Co.,	—
Townsend, Thomas	426
Treat, Orion,	603
Tucker & Cook Mfg. Co.,	569
Union Button Sewing Mch. Co.,	605
United States Rocking Grate Co.	441
Universal Winding Co.,	429
Vacuum Cement & Pulley Covering Co.	435
Vila, H. S.	580
Wagner, M. & Co.	559
Walcott & Campbell Spinning Co,	569
Walder, J.,	426
Walrus Fibre Mfg. Co.,	433
Ward & Vandegrift	426
Wardwell Needle Co.,	603
Warner, W. E. & Co.,	426
Warren Bros. Co.	427
Warren Company, The	546
Warren, W., Thread Works,	564
Watson, L. S, Mfg. Co,	424
Webendorfer & Walling	—
Weimar Bros.	604
Wells, Wilfred	600
Whitcomb, H. C, & Co,	434
Whitin Machine Works,	414
Whitinsville Spinning Ring Co.,	420
Whiton D. E. Machine Co.,	607
Whittier Mills,	567
Willcox & Gibbs Sewing Machine Co.	603
Wing, L. J. Mfg. Co., The	607
Wolhaupter, D. P.	445
Wolstenholme & Clark,	571
Woolford, George,	586
Woonsocket Machine & Press Co.	418
Worcester Warp Compressing Machine Co.	569

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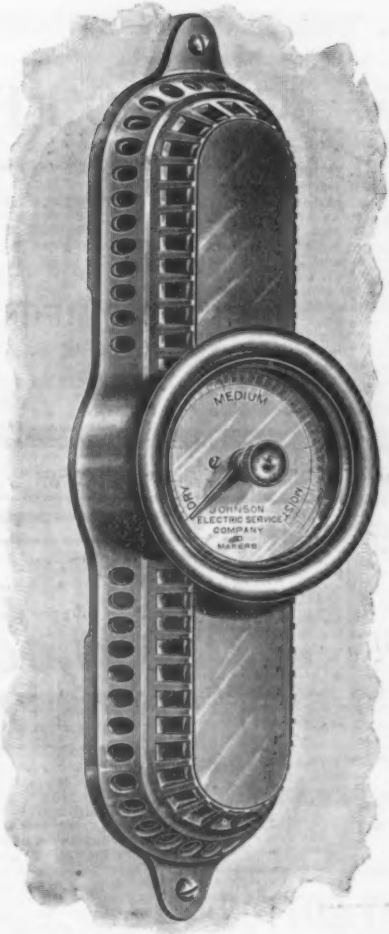

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WOOLEN SUPERINTENDENTS.

1829 **Woolen Supt.**, or asst. or dyer. Age 35; American; married. Has worked on kerseys, coverts, worsteds, cassimeres, etc. Is familiar with Davis & Furber jackets and mules, and Crompton & Knowles.

1833 **Wanted.** A position as superintendent of woolen mill manufacturing wool, or wool mixed hosiery or underwear. Is a practical man, understands carbonizing and mixing of stock, etc. References furnished.

1840 **Supt. Woolen Mill,** designer or overseer of weaving. Age 32; American; married. Has worked on kerseys, meltons, uniform cloth, indigo blue, doeskins, fancy cassimeres, cloakings, overcoatings, venetians, and broadcloth. Excellent references.

1841 **Superintendent.** Was eight years in every department and acted as assistant in England. Wants to get a start in this country. Would take position as assistant superintendent, designer, or assistant designer. Has had experience on high grades of plain and fancy woolens and worsteds, as well as army kerseys and cotton worsteds.

1823 **Supt., Designer or Overseer** of weaving. Age 42; English; married. Large experience on fancy cassimeres, cloakings, beavers, meltons, plaid backs, golf caps, rugs, union worsted suitings and government work, flannels, face-finished goods, and can make them up from the yarn. Is familiar with Crompton & Knowles and English looms.

1398 **Woolen Superintendent or Designer** of recognized ability and at present employed as a superintendent of 36 set woolen and worsted mill. He finds it necessary to remove from New Jersey on account of his wife's health. His past record is first-class and this is an unusual opportunity to secure the services of a first-class superintendent.

1575 **Assistant Supt. Woolen.** A graduate of the Philadelphia Textile School (highest standing), and has had more than 7 years' experience in the various departments of a Massachusetts mill. Wants to get a start where there is fair chance of advancement. Age 28, single.

1768 **Supt. and Designer** in a worsted or woolen mill. Prefers worsted mill. Now employed as designer and assistant supt., but is competent to take charge of a mill. Is familiar with all makes of machinery, and has manufactured nearly all classes of goods. Excellent references.

COTTON SUPERINTENDENTS.

1806 **I would like** to correspond with some president or manager of some cotton mill now running or any new mill now being constructed, who would like to engage a competent superintendent. I want to engage with a cloth mill of any number of spindles not exceeding 10,000. My price is $1,000 a year, with no loss of time. I am a practical manufacturer, of long experience as overseer and superintendent. I am a good manager, full of push and energy, and I have a good record as a hustler for big productions and making money for my employers. Strictly temperate.

1689 **Supt. or Assistant Supt.** Age 37; American; married. Large experience as overseer and first-class references. At present employed as overseer, but is capable of filling a superintendent's position. Worked on prints, twills, sheetings, cambric and fancies.

1802 **Supt.** or agent of small cotton or knitting mill, or would take a position as overseer of cotton carding. 33 years old; American. Has worked on sheetings, shirtings and fancy goods, and hosiery and mill supplies. Wants about $25 per week.

1453 **Superintendent** desires position in a cotton mill. Age 28; married; American. Has worked on prints, fine sateens, sheetings, ginghams duck, denims, cottonades, ticks, awnings and domets. Is familiar with all makes of spinning, spooling and warping machinery. Refers to past employers.

1806 **Supt. of a Cotton Weaving Mill,** colored or white, 5,000 to 10,000 spindles; or overseer of weaving in a cotton mill, on any kind of work and any size mill, white or colored. Will go East, West, North or South, Canada or Mexico. Has had good and long experience. A married man; 40 years old, strictly temperate. Can give references as to ability and character.

189 **Cotton Superintendent** wants position in Northern mill. Has been in charge of Southern mills for 7 years. Previous experience in N. E. Is well known among mill men, and can furnish the best of references. Age 35; married.

1772 **Supt. or Overseer of Weaving.** Age 38; American; married. Lawns, fine sheetings and shirtings, sateens, twills, fancies, denims and cottonades. Is familiar with Whitin, Lowell, Draper, Northrop and English machinery. Not at present employed.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills

WOOLEN CARDERS.

1798 **Boss Carder,** or carder and spinner. Age 49; English. Large experience on fine, medium and coarse wool, also wool, cotton and shoddy mixes, cassimeres, flannels, blankets, kerseys, meltons, beavers, government goods, etc. Excellent references and first class man in every respect. Was nine years boss carder in England and has held good positions in this country as boss carder and spinner.

1842 **Carder and Spinner in a Small Mill,** or spinner in a large mill. Has worked on wool, cotton, dress goods, cheviots, shoe cloth, hosiery yarn, and wool, cotton and shoddy mixes. Is familiar with Davis & Furber, Johnson & Bassett, Smith & Furbush machinery.

1701 **Boss Carder.** Age 39; English; married. Has had large experience as boss carder in Canadian mills, also held positions in England before coming to this country. Has worked on all kinds of wool, cotton waste, mungo and shoddy mixes, cassimeres, dress goods, knit goods, blankets. Can take position at once. Excellent references.

1827 **Overseer of Woolen Card Room.** Has worked on blankets, robes, friezes, cheviots, kerseys, flannels, knit goods, cassimeres, hair lines and unions. Age 34; American; married. Wants not less than $3.00 per day.

1801 **Overseer of Carding.** Age 27; German; married. Dress goods, knit goods, wool and cotton mixes, blankets and paper makers' felts, Is familiar with all kinds of American machinery. Wants $3.00 per day.

COTTON CARDERS.

1736 **Overseer Cotton Card Room and Combing.** Age 39; married. Has been overseer for past nine years. In last position seven years. Started up two large rooms with combers in each. Thoroughly understands all machinery in card room, and has run all grades of cotton. Can furnish references, if required.

1751 **Carder and Spinner.** Can give first-class references as to character and ability. Has had twenty-one years' experience as overseer on both American and Englih systems of carding. An American; 45 years old. Has worked on fine and coarse, also colored cotton.

1593 **Overseer Cotton Carding and Combing.** Now in charge of this department in a large N. E. mill. Has had first-class experience and is well recommended. Age 38; married, American. All grades of cotton.

1027 **Overseer of Cotton Carding.** Age 32; American; married. Has worked on coarse and fine yarn, from 10's to 170's, carded and combed, and is familiar with English and American makes of machinery. Will not work for less than $3.50 per day. Excellent references.

1782 **Overseer Cotton Carding.** Age 25; single. Fine carded and combed cotton yarns. Is familiar with all makes of machinery. Wants $3.50 per day.

WOOLEN SPINNERS.

1691 **Boss Spinner.** Large experience in first-class N. E. mills on flannels and all kinds of fancy cassimeres. Englishman; age 50; married. Refers to past employers.

1784 **Worsted Drawer and Spinner.** Would take twisting. Age 2-; English; single. Can furnish references as to ability and character.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

1648 **Boss Carder and Spinner.** Age 47; American. Has worked on cassimeres, flannels, beavers, knit goods, dress goods, blankets, shawls, all kinds of mixes, also shoddy. Understands spooling and twisting, and making novelty yarns. Temperate, steady, and refers to past employers.

1834 **Overseer of Spinning.** Experience covers eight years as second-hand and fixer and eleven years as overseer. Has handled nearly all kinds of goods. Is an expert fixer. Worked on Davis & Furber mules. Age 38; American; married.

1820 **Overseer in Woolen Spinning.** Has worked on ladies' dress goods, cassimeres, cheviots, beavers, all wool, and wool and cotton, and wool, cotton and shoddy mixes, from 1 run to 9. Davis & Furber Johnson & Bassett and Platt mules and jacks Refers to past employers. Wants $2.50 per day.

COTTON SPINNERS.

1663 **Overseer Mule Room.** Eleven years' experience in Fall River mills, and for the past ten years overseer of mule room. Excellent reference from present employer. Age 44, married.

1753 **Overseer of Spinning.** Wants position in the South. Has worked on prints, flannels, sheets, colored double nap flannel dress goods. Age 27; American; married. Excellent references from past employers.

1822 **Overseer of Cotton Mule Spinning.** Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York States. Has worked on colored hosiery yarn and filling.

1703 **Overseer Ring Spinning, Warping and Spooling.** Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married.

1779 **Boss Mule Spinner.** Now employed in South, but wants to change on account of climate. Has had 15 years' experience as a cotton spinner, working up to overseer from back boy. Is well acquainted with all makes of English mules, also latest Mason mules, and is familiar with the working of all drafts and twists. Married; 30 years old, and temperate.

1739 **Overseer of Ring Spinning** Spooling and Warping. Age 45; married. Wants to return to New England. A thoroughly practical spinner, and can furnish references from any mill where he has worked, and is a first class manager of help. Wants not less than $4.00 per day.

WOOLEN WEAVERS.

1645 **Overseer Weaving.** Age 30; married, American. Has worked in weave room since he was 17 years old, as weaver, fixer and secondhand of weaving, except for a short time was traveling salesman. Has worked on ladies' dress goods, men's fine worsted suitings, overcoatings, cloakings, etc., on Crompton & Knowles and Jacquard looms. Excellent references.

1857 **Overseer or Asst. Supt.** Age 43; German; married. Worked on carpets, Smyrna rugs, chenille, silk ribbons, woolen dress goods, suspenders, plushes and velvets of various kinds, and cotton woven body hammocks. Wishes to change on account of climate.

1688 **Overseer of Weaving** in large mill, designer in small mill, or assistant designer in a large mill. Age 38; German; single. Has worked on beavers, chinchillas, fine cassimeres, fine fancy worsteds, ladies' dress goods, army goods, union cassimeres and other classes of goods. Strictly temperate and industrious.

1536 **Boss Weaver or Superintendent.** Age 43; married; American. Can run any department in woolen mill, having been in business for himself. Not at present employed. Can take position immediately.

1607 **Worsted Weaver or Fixer.** Will accept fixing job at $2.25 a day. Experience covers worsted coatings, cassimeres, dress goods and jacquard work. Familiar with Crompton and English looms.

1805 **Boss Weaver.** Has worked on fancy dress goods, cashmeres, ginghams, fancy worsteds, coatings, lenos and Jacquards. Has also some knowledge of designing. English; age 36.

COTTON WEAVERS.

1783 **Secondhand or Overseer** of cotton weaving, or assistant designer. Age 25; American; single. Just completing two year course in both designing and weaving. Is a practical loom fixer of three years' experience.

1811 **Overseer of Weaving,** or second hand in large room. Fixed looms for six years in Jacquard shop and has had 18 years' experience as overseer. Has worked on print goods, sheetings, bed ticking, ducks and drills. Age 47; American; widower.

1832 **Boss Weaver.** Age 38; American; married. Has worked in weave room since 15 years old. Has a fair knowledge of designing. Has worked on beavers, cassimeres, worsteds, dress goods, blankets, both bed and horse blankets, cotton worsteds; in fact, all kinds of woolen goods, and is famil ar with Crompton & Knowles and Davis & Furber machines.

1843 **Boss Weaver,** or secondhand, or would take fixing job. Age 42; American; married. Worked on Davis & Furber cotton and woolen looms, Lewiston cotton looms, Crompton looms, and Knowles cam looms. Plain dress goods, heavy cloakings and men's suitings in different grades and checks and stripes.

1828 **Overseer of Weaving.** Has worked on denims, domets, tickings, jeans, ducks, shirtings, dimities, lawns and all kinds of twills, cottons, ginghams, sateens, and fine cambrics. Is familiar with Crompton, Whitin, Mason, Lowell, Draper, Pattee, English, Bridesburg and Knowles looms. Age 35; American; married. Several years' experience as overseer.

KNITTERS.

1836 **Supt. Knitting Mill,** or manager. Age 42; American; single. Five years as treasurer, manager and superintendent in a mill, and in previous position 13 years. Has personal knowledge of woolen and cotton manufacture. Worked on ladies' Jersey ribbed underwear, cotton, silk and woolen.

1831 **Boss Knitter** on circular latch needle machines, making ribbed underwear, or spring needle work made on Tompkins machine. Also a practical wool carder of about eight years' experience as overseer in underwear and shoddy mills. Understands raw stock and how to handle it so as to give best results. An American, steady and reliable. Age 36.

1824 **Boss Knitter or Fixer** on ribbed underwear. Has worked on fancies, double knees and tops and plain work. Is familiar with Brinton & Denny, McMichael & Wildman, Huse and Pepper machinery. Will work for $2.50 or more, according to position.

1554 **Boss Knitter.** Underwear, Jersey ribbed, lisle, wool, plaited work, silk Can handle any latch machine. Good references. Age 26; married.

1741 **Overseer of Knitting.** Has had 18 years' experience as overseer. Has worked on wool, worsted and cotton underwear; spring and latch needle machines. Age 33; married. Refers to past employers.

1776 **Boss Knitter.** Had constant experience in the knitting business for the past twenty years. Can handle any kind of goods made on a circular spring needle knitting machine. Age 36; American; married. Excellent references.

DYERS.

1626 **Dyer and Finisher,** with experience on plushes, dress goods, mohair and worsted genapped yarns, cotton and woolen yarns, raw stock. At present employed, but will consider position pay ing $3 a day.

1821 **Boss Dyer.** Age 35; American; married. Worked in hosiery dyehouse for seven years as boss dyer. Has had experience on fast black, lisle finish and extract work.

1809 **Boss Dyer.** Age 33; American. Wants $3.50 per day or more. Wants to change on account of locality. Has worked on fancy cotton yarns, mohair novelty yarns, worsted yarns, raw cotton, raw wool, piece dyes on flannel, mixed cotton and wool and all wool, kerseys and beavers and beavers with cotton warp.

1846 **Boss Dyer** or bleacher. Age 28; English; single. Has worked on mostly all kinds of dyed and bleached goods. Wants to change as place he is in does not agree with him.

1850 **Head Dyer** on cotton yarn or cloth, or would take a position as chemist, sample dyer in an aniline manufacturing company, or dyestuff salesman. English; 26 years old; married. Strictly temperate, and can furnish references.

1839 **Boss Dyer.** Age 35; English; married. Has been boss dyer for 14 years on all classes of woolen and cotton goods, such as piece dyeing, raw stock, woolen and worsted yarns, etc. Is steady and reliable and temperate. Assisted father in large dye works in England for seven years.

FINISHERS.

1792 **Boss Finisher,** with over 20 years' experience on all kinds of woolen and worsted goods. Learned business in one of the best woolen mills in Scotland and has also had experience in some very good mills in this country. Strictly temperate and steady, and can give good references as to character and ability. Wants position in a good, steady-running mill at once. Age 38 years; married.

1613 **Boss Finisher.** One of the best finishers we know. Has held first class positions, and worked 13 years in last place. Is out at present for good reasons. Would like to make a connection with a first class mill at once. All kinds of woolen and worsted goods.

1663 **Overseer Mule Room.** Has been in present position 10 years' and can furnish most excellent references. Wants to change on account of family. 44 years old. Wants $3.00.

1506 **Overseer of Worsted or Woolen Finishing.** Has had full charge of burling, mending, wet and dry finishing and shipping. Has worked on fancy dress goods, cheviots, men's suitings, flannels, thibets and cloakings. Is familiar with English and American machinery. Refers to past employers.

1499 **Overseer of Finishing.** Has worked on kerseys, cassimeres, broadcloths, worsteds, venetians, cloakings, tricots, overcoatings, suitings, shawls, flannels, beavers, dress goods, and face finished goods of all kinds. Was in a large N. E. mill as overseer for 14½ years. Is 45 years of age.

1804 **Overseer of Finishing.** Wants to change on account of town he is in. Is familiar with all kinds of woolen and worsted machinery, and has worked on kerseys, cassimeres, carriage cloth, worsteds, dress goods, shawls, etc. Age 35; American; married. Wants $3.00 per day. Excellent references from past employers.

DESIGNERS.

1789 **Designer,** or assistant supt. and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill.

1445 **Designer or Finisher,** or will take position as supt. of a small mill. German; Protestant; age 36; married. Has worked in several New England mills, and refers to them. Graduate of the Werden Textile School, Saxony. Has worked on kerseys, beavers, cassimeres, cheviots, etc. Is familiar with all makes of American and German machinery.

1837 **Designer** in small mill, or assistant in large mill. Age 24; Scotch; single. Has worked on fancy cassimeres, plaid backs, coverts, unions, worsted trowserings and shirtings. Fair knowledge of Jacquard designing. Johnson & Bassett mules, Davis & Furber dresser, and Knowles looms. Is willing to work for moderate salary, with chance of promotion.

1838 **Designer,** assistant supt., assistant designer, overseer of weaving, secondhand large weave room, loom fixer, boss spooler, dresser, or mender. Age 48; American; single. Worked on worsteds, cassimeres, dress goods, blankets, chinchillas, cloakings, etc. All patterns of Crompton & Knowles looms, Davis & Furber spooling, dressing and weaving machinery, and Worcester warp compressor.

MISCELLANEOUS.

1810 **Dresser Tender.** Age 23; German, single. Is familiar with Davis & Furber and Cleveland dressers. Will not change for less than 20 cts. per hour.

1746 **Overseer Warping and Dressing,** or weaving, warping and dressing. Has worked on woolens and fancy worsteds. Is familiar with Davis & Furber dressers; Draper, Phenix and Lowell Machine Shop warpers; English plain and Crompton looms. Wants $3 a day.

1762 **Chemist.** Age 23; American. Wants a position in dye works, print works or bleachery. $15 a week to start on. Excellent references.

1835 **Beamer, Twister,** also understands drawing in and splitting. Age 27; American. Has worked on ginghams, dress goods, shirtings and cotton worsted.

1744 **Fixer.** Age 24; American; single. Is familiar with Boss, Invincible, McMichael & Wildman, Brinton, Denny and Victor machines. Wants $15 a week.

1851 **Machinist in Woolen Mill.** Can repair looms, cards, mules, etc., of every description, also worsted machinery. Understands forging tools and has fair knowledge of electricity. Ten years experience in some of the best mills in New England.

1845 **Fixer** or secondhand. Age 40; American; married. Worked on all kinds of spring needle work, also latch to a good extent. Gauze underwear, rubber lining, cuff knitting and ribbed hosiery.

1815 **Master Mechanic.** 31 years of age; married; American. Has worked in cotton mills for the past 16 years. Wants to change on account of unhealthy locality. Can furnish excellent references.

1704 **Boss Dyer.** Age 36; English; single. Is familiar with dyeing cotton yarn and warp both for bleaching, fulling and other purposes. Has dyed for the best firms in England, also for export work.

1723 **Dresser Tender.** Age 42; married. 15 years in a mill as overseer. Is familiar with all makes of machinery. Can take place at once.

1351 **Boss Woolen and Worsted Finisher** is looking for a position paying $3.50 or more. Age 31; Has worked on all classes of woolen and worsted goods Can furnish excellent references.

1764 **Engineer and General Repair Man.** Age 45; American; married. Wants $2.50 to $3.00 a day. Over twenty years' experience.

1765 **Overseer Cloth Room,** white or colored. Age 42; American. 25 years' experience as secondhand.

1817 **Chief Engineer or Master Mechanic.** First class man for a cotton mill. Has been employed as machinist in various cotton mill repair shops, and in repair shops building new cotton machinery. Proficient as a draftsman on mechanical drawing. 38 years old; married.

1826 **Wanted by Steady, Industrious** man, a situation as overseer, in Tape mill. Has had considerable experience, but does not know everything, but willing to improve. Would start at $1.25 per day for six months. Has been overseer a short time, and has perfect control of help. Age 46; English; married. No family. Would go anywhere, and settle.

THOS. H. DOANE, 233-225 MONROE STREET, CHICAGO.

MANUFACTURERS' AGENT.

SELLING DIRECT FROM MILLS.

Woolen and Cotton Accounts Solicited. Ample Room for Storage.

References given. Bond if necessary.

F. GUTMAN. M. WAGNER.

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Direct Selling Agents for Hosiery and Underwear Mills.

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Selling Jobbing Trade Exclusively.

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DIRECT AGENTS

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1716 **Finisher.** Age 29; English; married. Has worked as wet finisher, shearer, gigger, second-hand and overseer. Prefers a mill making cassimeres, worsteds, dress goods and face finished goods. A high grade of goods. Is familiar with all kinds of American and English finishing machinery, and can keep same in the best of repairs. Prefers Eastern States. Can take position at one week's notice. Best of references.

Established 1844.

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SPINDLES, FLYERS, RINGS, TUBES, CAPS, &C.

FOR

Cotton, Silk, Flax, Woolen and Worsted

MACHINERY.

Roving Spindles and Flyers a Specialty. Light Forgings. Repairing of all kinds.

WANTED,

A Practical Knitter

One who can take entire management of Knitting Department, desirous of making a reputation, has push, and ability. Mill established 1889 (located Middle West, beautiful city of 7,000), output $50,000 a year. Address, "KNITTER," care of Textile World.

SECONDHAND CABLER WANTED.

State age, maker and price to A. R. T., care this paper.

COTTON FACTORY FOR SALE.

A good thing for the right party. A water power cotton factory now running in part, and bringing in good revenue to leaser. Can be secured at a great bargain because of owners inability to look after it. A two cent stamp will secure full particulars to one interested and who means business. Address J. A. WIGGS, President, Starkville, Miss.

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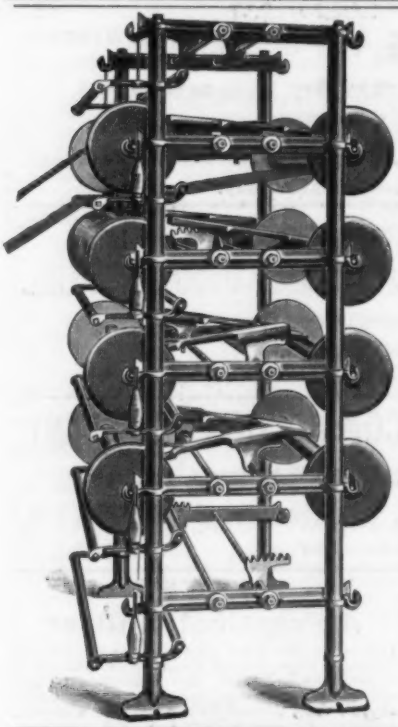

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used to be in the goods. Now they are

in the Equipments.

For instance this

Improved Spool Rack

makes a profit in one branch—

It comes nearer than any rack on the market to-day in making an

Ideal Warp

It gives a uniform tension on every thread in the warp from full to empty spool, which can be perfectly regulated. The double bank fo spools mixes the yarn better and prevents spool streaks, There are a number of othei good points brought out in our circular on the subject. Send for it.

Worcester Warp Compressing Machine Co.,
Worcester, Mass.

A PERFECT FAST BLACK FOR HOSIERY.

The New Dubois Sanitary Black Leads Them All.

It has been adopted by many leading Hosiery Manufacturers all over the country.

Mills started with the dye formula for black, colors, and bleaching, or black alone, or black and colors and taught by me personally, with my latest oxidizing machine (patents applied for), also with dye formula and lisle finish (patents applied for), or for dyeing and lisle finish formulas only. Will arrange for payment in lump sum or in instalments.

This black is inexpensive, non-poisonous; the color is uniform with every lot; it will not crock, and it leaves the goods strong and of a beautiful color, either blue or jet black, as desired.

Stockings dyed in one dip right from the knitting machine without bottom or topping.

This is the best, safest and finest black in the world, and costs as follows:

No. 1 Black, positively ungreenable, $3.00 per 100 lbs.
No. 2 Black, a splendid black, $2.50 per 100 lbs.
No. 3 Black, an all around fine black, $2.00 per 100 lbs.
No. 4 is a black as good as any you can get from other dyers, and costs $1.50 per 1.00 lbs.

I guarantee all above in every particular, or NO MONEY. Address direct the inventor patentee,

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NOTE—I have no agents, but sell direct only.

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E. HOWARD & CO. Watchman's Clocks.

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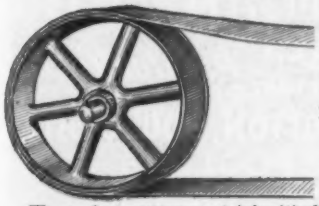

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SHORTENING or taking up same unnecessary.

Excessive use of dressing avoided.

By the use of the **Acme Covering on your Pulleys.**

Prevents slipping, retaining full speed, giving you the best possible results that can be obtained in the running of your belts. Can be applied on all kinds of pulleys.

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Various Systems of Counting Yarns; Resultant and Average Counts; Relative Weights and Cost of Twist and Mixture Yarns; Weights and Cost of Warp and Weft; Sett Systems; Weight and Cost of Woven Fabrics; Reproduction of Woven Fabrics; Conditioning; Construction of Woven Fabrics; Exercises with Answers Over 200 pages. Full bound in cloth

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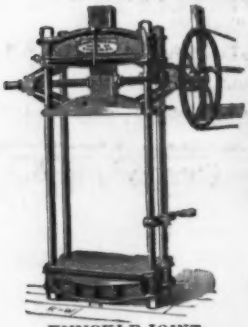

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IMPROVED UPRIGHT SPOOLERS

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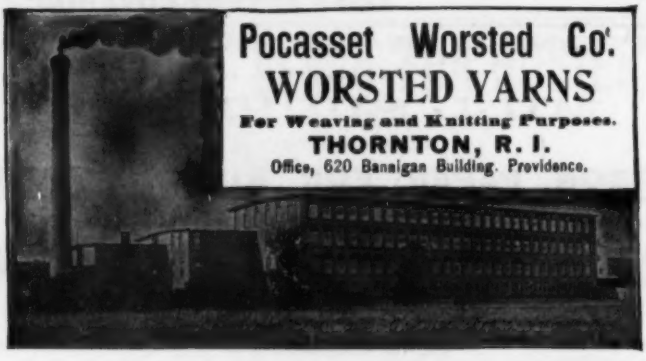

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Mohair Plushes,

Worsted and Cotton Braids.

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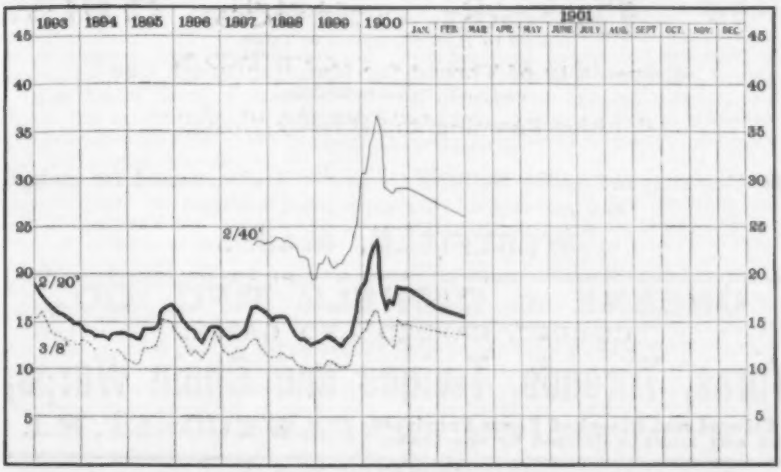
ESTABLISHED 1861.

YARN DEPARTMENT.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Yarn.

The trade has continued in the same lethargic condition that we have previously recorded. The action of the Southern mills in reducing output has been welcomed by the trade generally, as the enormous stocks were a serious menace to values.

Prices have receded, as our chart shows. We quote as follows:

Eastern mule yarn:—

10s	17 to 17½
14s	18 to 18½
18s	19 to 19½

Weaving yarn (warps):—

14/1	14 to 14½
16s	14¾ to 15
20s	15½
22s	16
14/2	15
16/2	15 to 15½
20/2	15½ to 16
24/2	16½ to 17
30/2	17½ to 18

Skein:—

9/4 slack,	14
16/3	15
5/1 soft.	13½ to 14
8/1	14½
10/1	14½ to 15
14/1 hard,	14½ to 14½
8/3	14
20/2	15 to 15½
30/2	17 to 17½

Philadelphia Yarn Market.

The market on yarns has changed very little since our last report. The demand is still less than the supply, although it is thought that the recent heavy curtailment by the spinners, will reduce the supply. We know of some mills that have run down all their accumulated stocks, and have been obliged to start up part of the spindles previously shut down, to keep up with their orders.

Prices have not advanced and they are positively below the cost of making the yarn. It is understood there have been some cancellations on underwear, hosiery, etc., but spinners do not allow cancellations on yarn. They can not stand it. There is practically no market price today.

Southern Cones:—

6s and 8s	15 to 15½
10s	16 to 16½
14s	16½ to 17
16s	17 to 17½
18s	17½ to 18
20s	18 to 18½
24s	19
30s	19½ to 20
40s	28 to 30
50s	35 to 40

Southern mule yarns will bring about ½ cent, possibly 1 cent per pound more than these figures.

W. Warren Thread Works,

SPOOL COTTON
on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use
on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns
on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

WESTFIELD, MASS.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

INCORPORATED 1884.

STANDARD THREAD CO.,

Manufacturers of

SPOOL COTTON

For the Manufacturing Trade.

NEW YORK CITY.

Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, Philadelphia, Pa.

INDIAN ORCHARD COMPANY,

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Manufacturers of - - - -

COTTON WARPS AND YARNS
In gray and all colors, single or in any twist.

NOVELTY YARNS
In Cotton, Mercerized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.

We are always pleased to assist our patrons of the Woolen Goods manufacture in specia pattern warps for samples.

Carded and Colored Cotton for Mixing With Wool

Machined, or in Roving.

Woolen Yarn.

The manufacturers of underwear are at this time between seasons, and yarn spinners looking for orders from this source are at a standstill. Knitters of lightweight underwear are fairly well employed; those manufacturing heavyweights are receiving but few orders.

There seems to be a deadlock between the buyer and the producer; buyers believe that lower prices should and will prevail because of the lower price at which wool is now selling; they compare this year's prices with that of last year, and contend that the price of underwear should decline in the same ratio as the price of wool; but the manufacturers show that this cannot be expected because last year cotton and shoddy and coarse wool was used in order to meet the so-called popular prices demanded by buyers, while this year the manufacturers are producing their standard garment out of all-wool at the same price at which poorer garment of last year was produced.

Some buyers are angry at this state of affairs; and in an interview with the manufacturers on this subject we get the following version of the trouble. In one instance the buyer said that the garment offered at this time was not any better than the deliveries last made him. This the manufacturer admitted to be true, "but," said he, "compare the garments last delivered with the samples originally sold and you will see that the former are at least 100 per cent. better than the latter. As the market for wool declined during the season we bettered the quality of our production, and got back to our full standard of grade." This has been done largely throughout the knitting district, and was done as a protection to manufacturers themselves to prevent cancellations.

Within the next 30 days orders will have been placed in fair amounts, but orders are going to be placed conservatively, and a large duplicate business with few cancellations will be the result.

Manufacturers are not inclined to place orders for stock because they do not know exactly what their requirements are going to be, and while stocks in the hands of manufacturers are undoubtedly low, yet with the sagging tendency of the wool market and on account of the backwardness of receiving orders for their production they are loath to place orders for material.

Some of the far seeing ones believe that the market has about reached its lowest level, and are quietly making purchases. Other manufacturers say that they want material but are in a

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Mule Spun Hosiery Yarns, Carded and Combed.

Colored Yarns, Solid, Mixes and Randoms.

Spinners of Cotton Yarn

Frame Yarns, Single and Twisted, Carded—Combed—Bleached

Fine Yarns, For Electrical Purposes

All Numbers 4 to 200.

From

American Peelers, Sea Island, Peruvian and Egyptian Cotton.

BENNETT, HOWLAND, ROTCH, N. B. SPINNING, COHANNET, NEMASKET, GLOBE, SANFORD, } **650,000 Spindles.**

Entire product sold direct to consumers through the Company's own offices.

CAPACITY, 50,000 Spindles.

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COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

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AMERICAN MOISTENING COMPANY,

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The "Drosophore" and "Vortex" Humidifiers.

Over 20,000 of our HUMIDIFIERS in operation.

Highest award on the Recommendation of The FRANKLIN INSTITUTE for

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DANA WARP MILLS

Westbrook, Maine.

WHITE AND COLORED WARPS,

6s to 50s—Single and Ply.

MULE COPS,

from 30s to 50s from

AMERICAN AND EGYPTIAN COTTON.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Manufacturers of

Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS

Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL, WORSTED, MOHAIR AND SILK.

Cotton Warps. ON BEAMS, JACK SPOOLS AND TUBES. IN FANCY TWIST COLORS AND PRINTED.

quandary about placing orders. It is stated that if the flat goods underwear trade revives, as the present indications point, the supply of black wool for mixing will soon be exhausted.

The cause of this shortage is easily explained. In the eastern markets all the wool has been opened, and the black has been taken out and sold; in the West none of the wool has been opened and the black wool cannot be taken out until it is; hence the shortage.

Fleece lined underwear is selling at prices which are lower than last year, although raw cotton is at least 3 to 4 cents per pound higher. Now either one of two things must be a fact; the manufacturers had a large profit in these goods, or the goods are now being manufactured at a loss.

During the great advance in January, a certain large knitter telegraphed his agent to reduce prices 12½ per cent; the agent, in telling of this reduction, stated that his mill

BARNESVILLE MFG. CO.

BARNESVILLE, GA.

HOSIERY AND UNDERWEAR YARNS,

Peeler, Bleached, Egyptian or any colors desired. Also,

FINISHERS AND BLEACHERS

of piece goods, underwear, towels, yarns, etc.

THE ONLY USERS OF JACKSON'S FORMULA OXIDIZED BLACK FOR HOSIERY.

We solicit your patronage. Work Guaranteed.

NEW YORK OFFICE and SALESROOM, 910 N. Y. Life Bldg., N. Y

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double and Twist, **COTTON WARPS**

HOUSATONIC, MASS. 4s to 60s.

COTTON YARNS

from 2s to 26s single and ply.

SPECIALTY—FIRE HOSE CORD

and Yarns put up on tubes wound on Universal System.

WHITTIER MILLS, - - - *Lowell, Mass.*

Incorporated 1899.

AMERICAN COTTON YARN EXCHANGE

Long Distance Telephone, Boston 1100.

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COMBED AND CARDED COTTON YARNS

From Northern and Southern Mills.

American, Egyptian, Peruvian and Sea Islands.

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BOSTON, - - MASS.

J. S. DODDS,
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MERCERIZED YARNS
Two and Three Ply, for All Purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.
Through H. A. CAESAR & CO.

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Mercerized, Turkey Red, Gassed } **Cotton Yarns.**
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COMMISSION MERCHANTS.
COTTON YARNS of all Descriptions.
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Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited,

E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns, Double and Twist Yarns for the Weaving Trade.
PAWTUCKET, - R. I.

DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted. Cable Cords and Twines.
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Cotton Yarns, Cotton Cloth, Silesia, Sateens
for the Underwear Trade.
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LACINGS For Overshirts and Underwear.
Tipped and Tasseled.
HEPNER & HORWITZ. 30 Howard St. N.Y

could not have done it had he not had a large stock of cotton on hand. It was pointed out to him that he could have sent this cotton to New York at the time that cotton ruled 12¾ cents, and have realized 2½ cents per pound profit on it.

Cotton has acted so queerly that perhaps the knitters were after all selling short. Spinners are all working hard for orders, but are being put off by prospective buyers, although some good orders are undoubtedly pending; spinners ask how they are going to exist on promises.

Some of the wise buyers of yarn are taking advantage of the low prevailing prices. Australian thread wool and fine noils are going to be imported in good quantities, because the mills have all been running slack, and the grades mostly run have been ¼ blood stock; and thus it is that many manufacturers will use imported thread-waste and noils.

Progress in Dyeing Cotton Yarn in 1900.

In a resume of the progress made during 1900 in the art of coloring cotton yarn, the Ost. Woll. und Lein. Ind. says that bleaching by electricity has not advanced, and has disappointed the expectations of a few years ago as to the advantages of this process. While the electric bleach leaves the cotton fibre stronger and in better condition than does chloride of lime, this is due to the substitution of soda salt. For fine yarn, lace and similar goods where hypochloric acid is suitable, the results of the electrolytic bleach can be obtained by mixing soda with the lime. The high price of coal has made steam power so expensive that the use of the electric bleach is entirely out of the question except where there is an ample supply of water power.

At any rate, we can thank the electric bleach for teaching the importance in the bleaching process of a thorough preparatory steeping of the fibre. Bleaching in the cop can be done in any of the cop machines, but it is necessary to have the apparatus lined with lead to enable it to withstand the action of the bleach.

Dyeing Machines:—The Obermaier machine continues the best for coloring loose cotton, cotton on spools and yarn, but is not so well adapted for dyeing cops. We have obtained very good results with dark shades on warp cops, but it is very difficult to get uniform colors on hard twisted cop yarn. For skeins this machine does not give as good results as regards brightness and uniformity of shade as can be secured in the open tub process, but very fine yarn, No. 120 to 160, becomes matted and tangled when colored by hand on sticks, while it comes out of the Obermaier machine in nearly as good condition as it was before being colored. Several other makes of machines are mentioned, and the writer states that many European mills producing large quantities of colored yarn, have their own dyeing ma-

chines, the construction and operation of which are kept secret.

Mercerizing:—The use of mercerized yarn has increased for knitted and half-silk fabrics, while it has diminished somewhat for clothing and dress goods.

New Dyestuffs:—Immedial Blue has been found especially well suited for the steaming process, which has thus become so simple as to cause surprise that the expensive peroxide of sodium was used so long. The skeins are extracted to remove surplus moisture, and then placed in the ordinary steaming apparatus, protected with a wooden cover over which a woolen cloth is drawn, and kept under steam pressure for one-half hour. Care should be taken not to pack the yarn too closely, and also to have the steaming kier well heated before yarn is entered.

Worsted Yarn.

Spinners are hard after orders, are getting a few small orders but no volume of business. The heavyweight season is backward, and the cloth buyers are taking only sample pieces to be duplicated later in the season. In fact buyers cannot see the bottom of prices and after their last experience will take no chances. Some in a position to know predict that the business with weavers will be slack until April.

Mills running today are making piece orders, and can see the end of orders unless in the meantime a brace in business is experienced.

It is undoubtedly a fact that buyers are getting nearer the season for which cloth is wanted. It will be remembered that in 1894 the mills received no orders until June, and then ran hard all summer on heavyweights.

Weavers state that they will only buy as yarn is required, as it is folly to buy yarn in large amounts when the next week the same yarn can be bought for less money. Whether it is the true policy or not, this is what the mills are doing.

Weavers are content if they can get their sample pieces well distributed, as they will then be sure to get orders in good amounts as the season develops. Last year they sold up early, contracted for yarn and then had all orders cancelled; consequently, lost much money on the yarn purchased to fill these orders.

The present season will demand the two extremes of yarn for good cotton worsteds; 2/50s and 2/40s will be used of a very good grade; 2/14s and 2/26s ¼-blood and ⅜-blood yarn will be used for piece dyes and cheviots.

We note throughout the weaving trade a hopeful feeling, and all say that later a good business will be secured. Many mills have put two or three lines of samples on the market,

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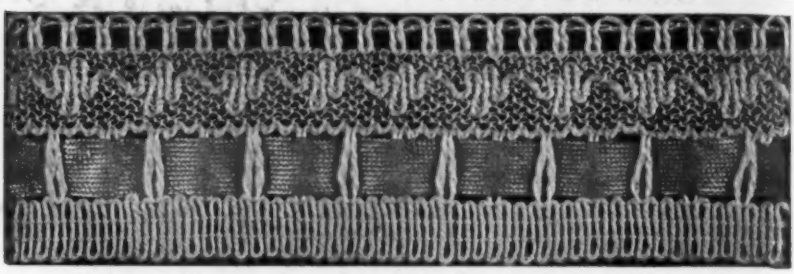

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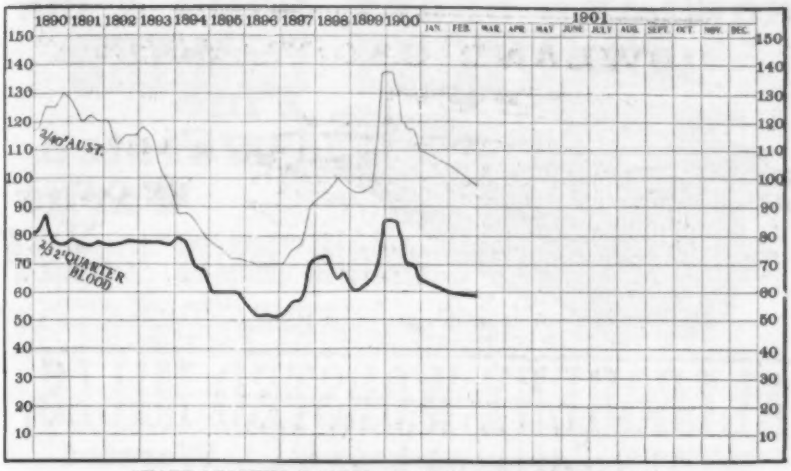

CHART SHOWING RANGES OF PRICE OF WORSTED YARN.

and a continued demand for undressed worsted is being experienced. Piece dyes, cheviots and cotton worsteds for pantings, are selling best.

We hear complaints from buyers at the sharp dealings of some of the weaving mills in not delivering cloth according to sample during the late advance in wool; the result today is the weavers who have kept to agreement and delivered goods as promised, are getting whatever business there is going.

Spinners state the present is the dullest period they have had to contend with for some time. Weavers will talk large orders, and end by placing orders for small amounts. French spun yarn is slack, although some sampling has been done.

Top making is dull, and no business is doing to speak of; all those who own stock are working hard to dispose of it at the best advantage, and do not like to sell unless the highest prices can be secured.

We quote on worsted yarn:—

2/40s Australian & Delaine	95 to 1.00
2/40s half-blood,	75 to 85
2/30s half-blood,	68 to 78
2/14s and 2/26, ¾ blood,	65 to 70
2/14s, ¾ blood	49 to 57

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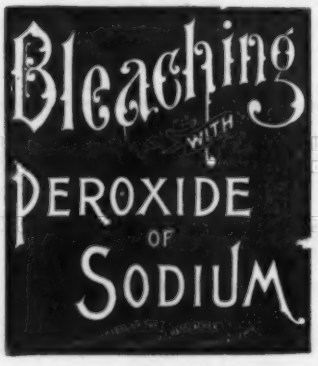

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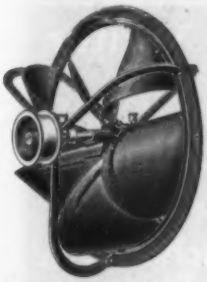

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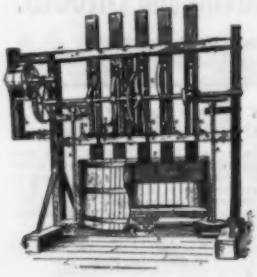

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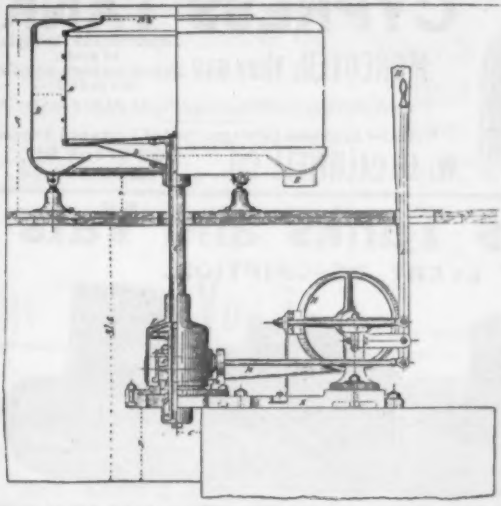

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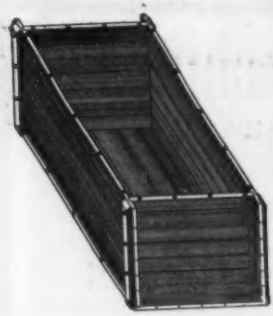

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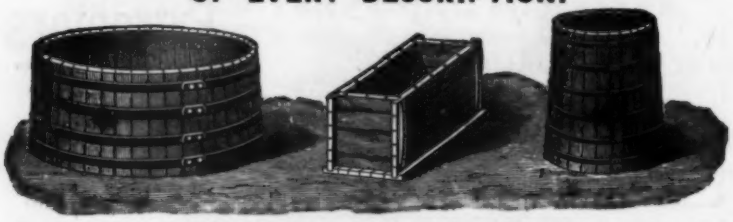

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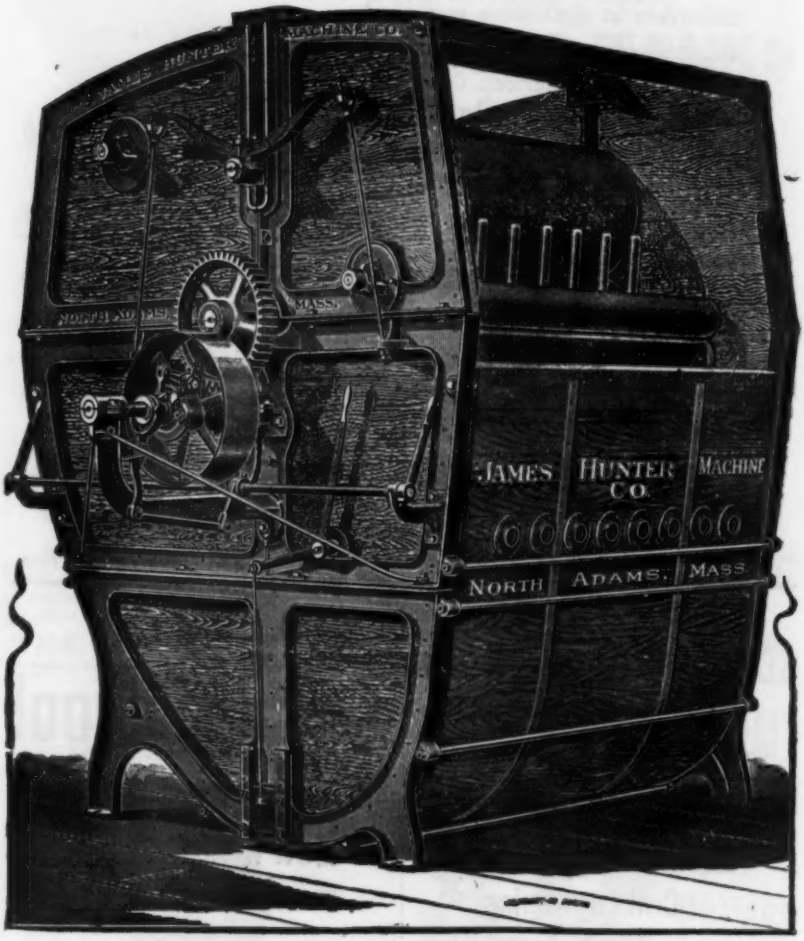

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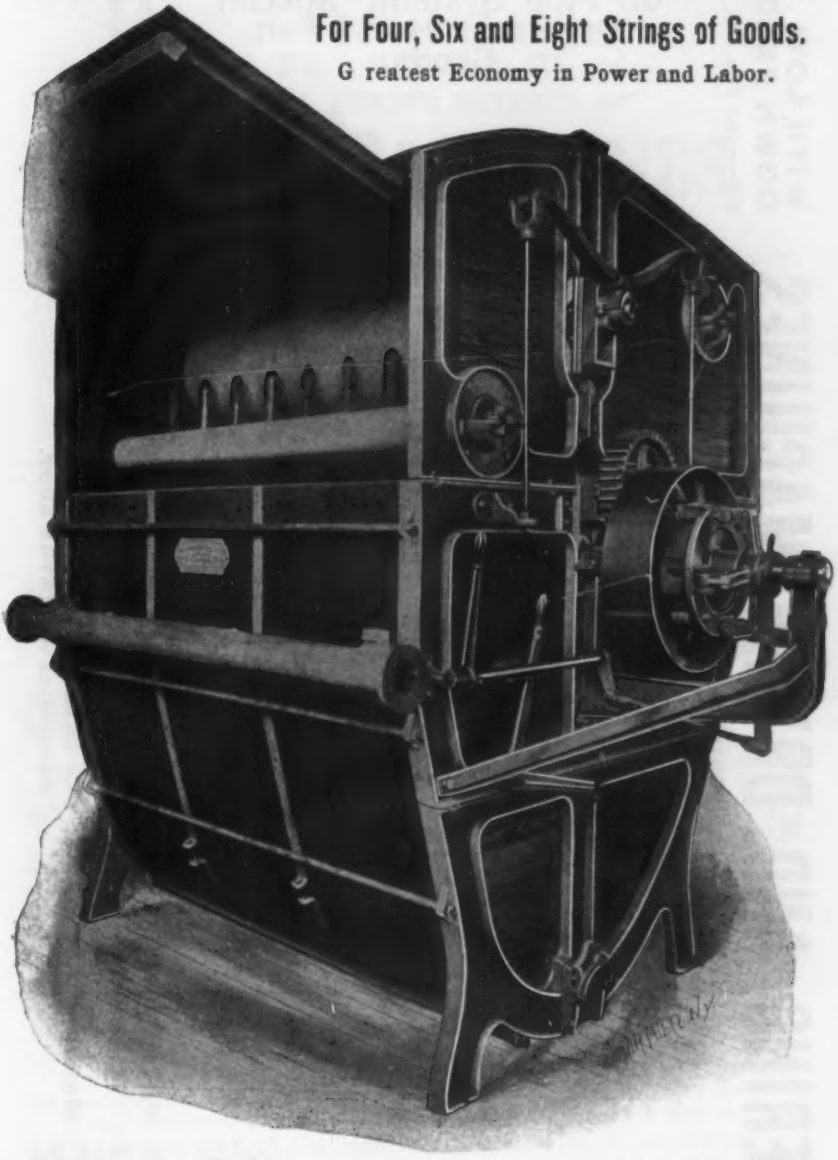

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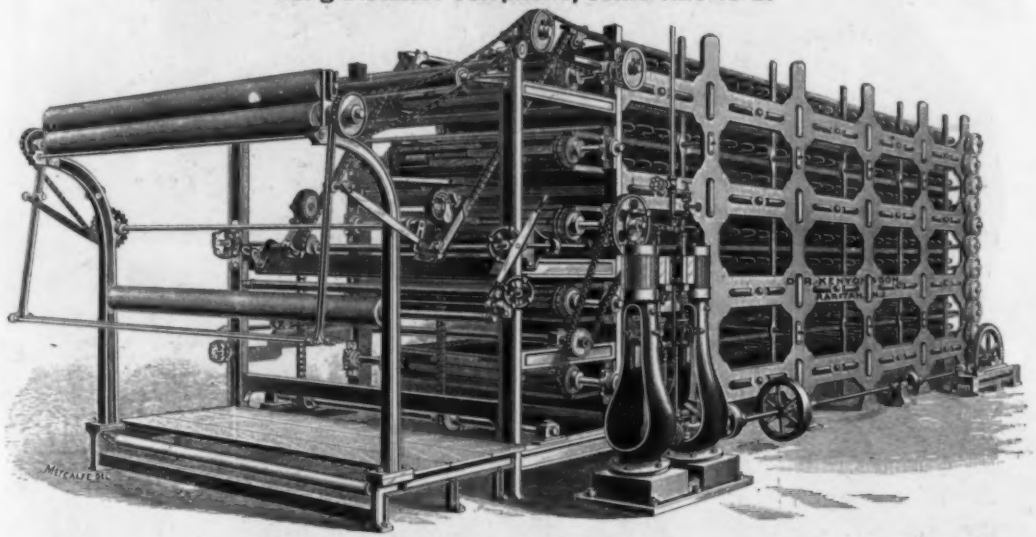

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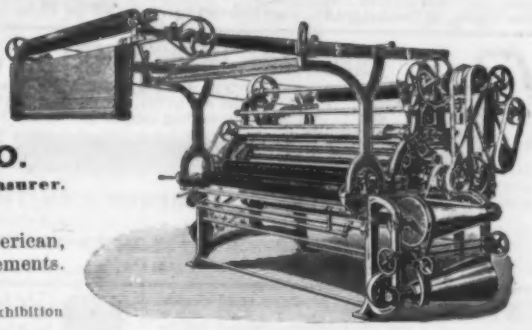

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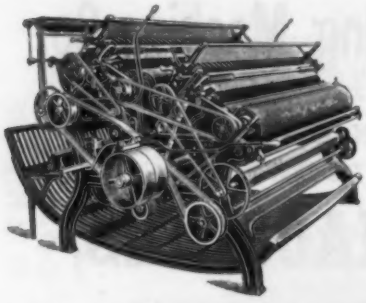

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It is the only full automatic machine made to be fastened to a bench, occupying no more space than semi-automatic machines.

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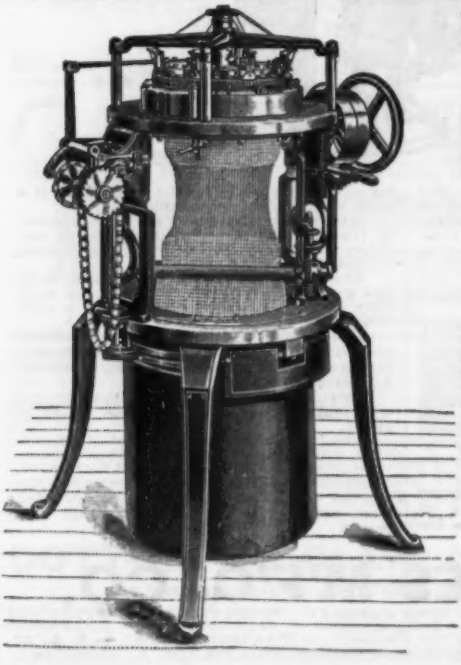

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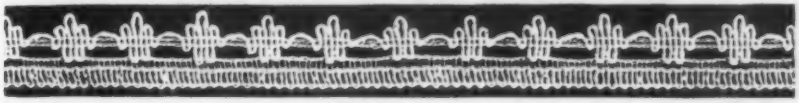

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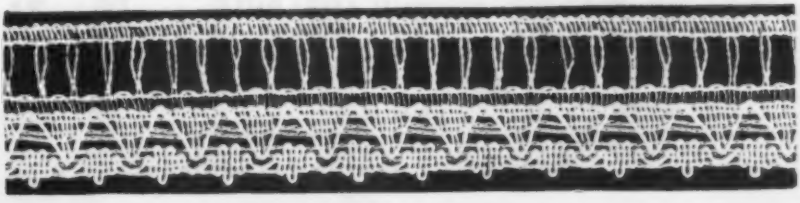

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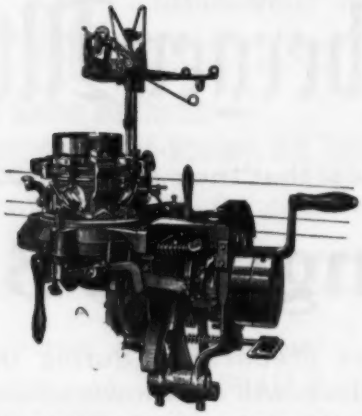

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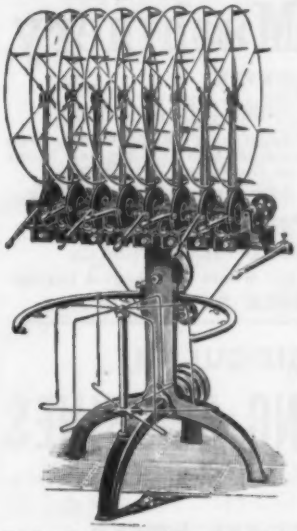

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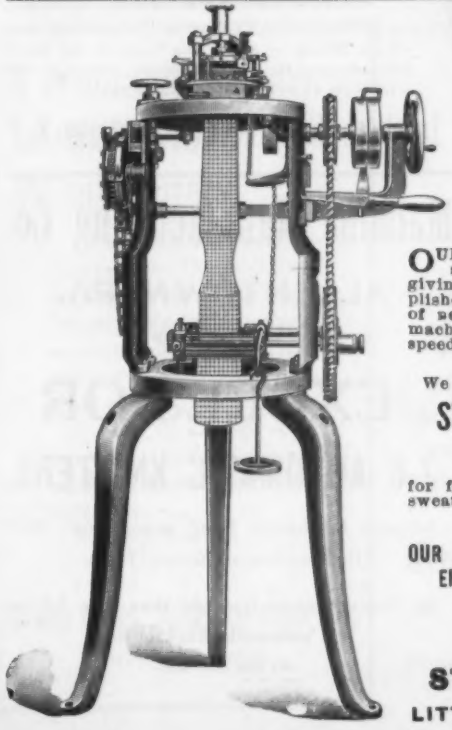

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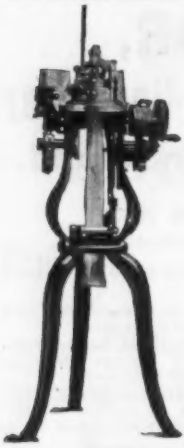

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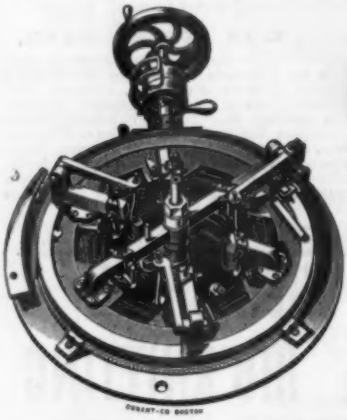

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Either plain or full automatic, with stop motion complete, for

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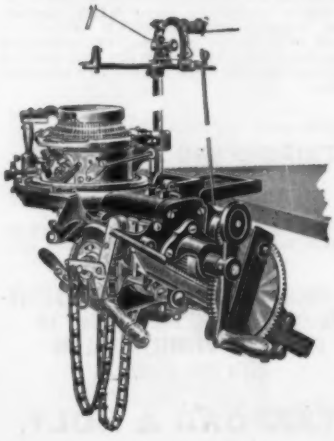

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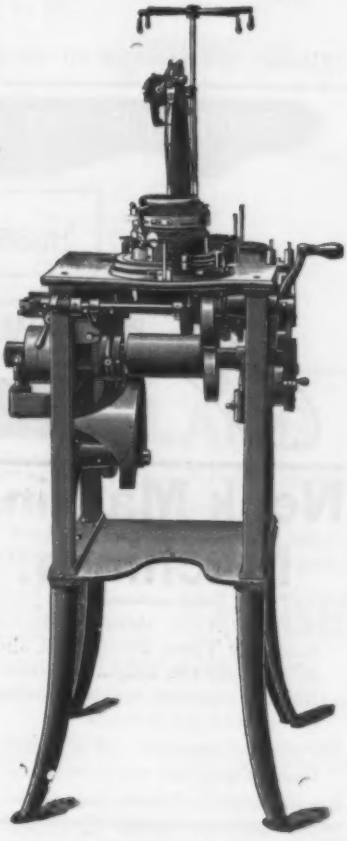

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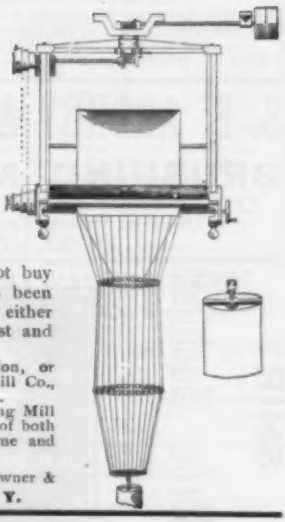

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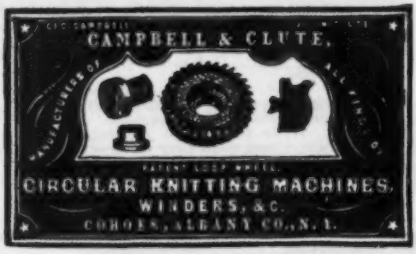

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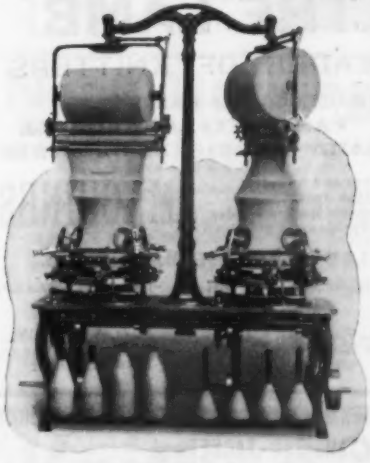

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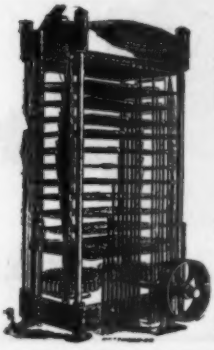

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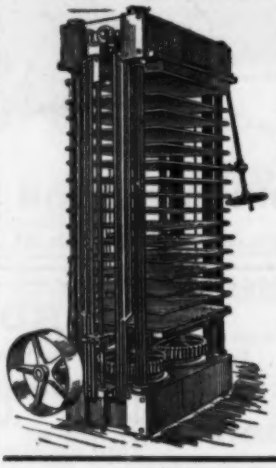

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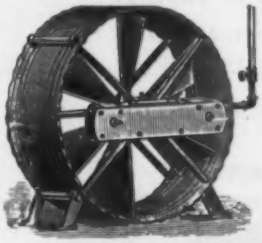

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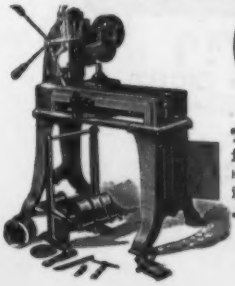

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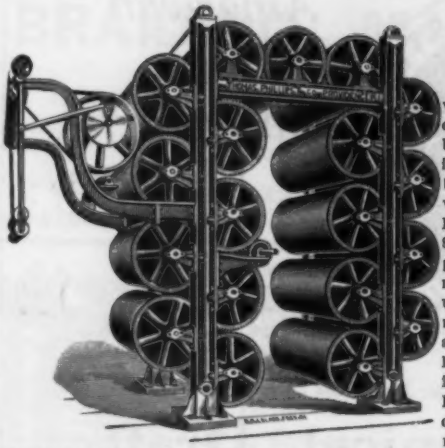

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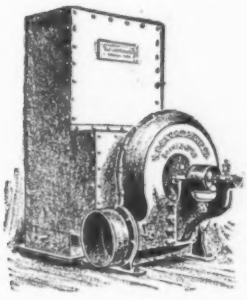

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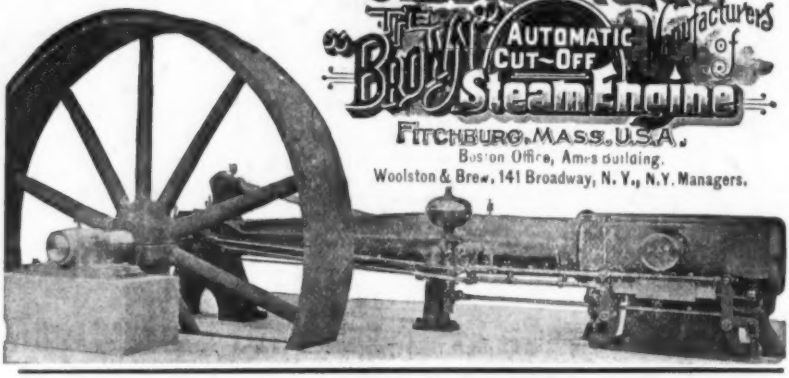

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